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ABSTRACT

This report of a conference on the use of telephone technology in education includes 43 papers which deal with such areas as the use of the telephone in teleconferencing, designing teleconferencing programs, staff meetings, health professional continuing education, telecourses,communicaton and information networks, tutoring, party-line education, dial access information systems, and several case studies. (CMV)

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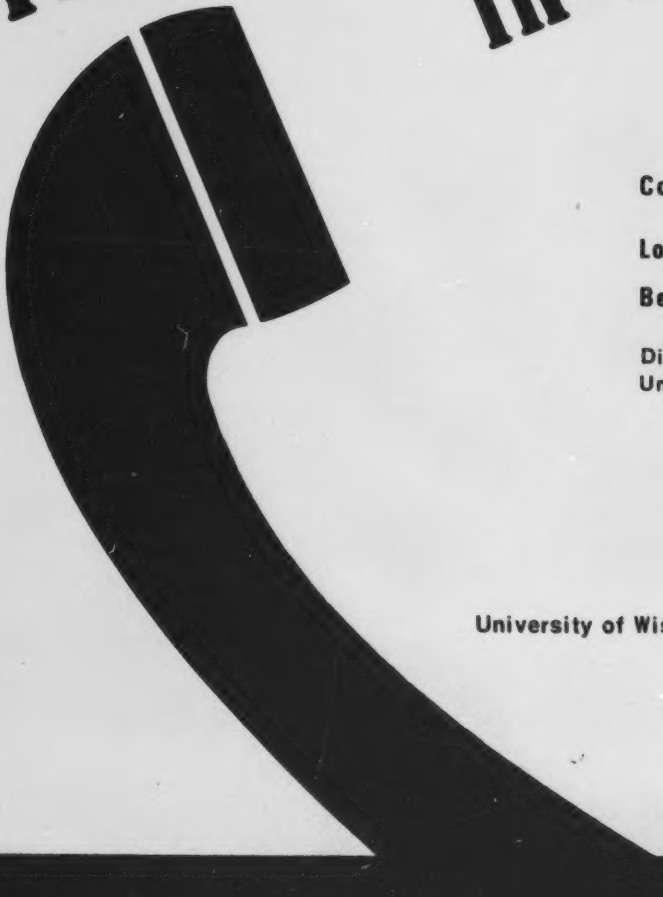
The Status of the Telephone in Education



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PREFACE

Lorne A. Parker

Changing needs and life-styles of students are forcing educational institutions to seek new and flexible means of communications--and to do so against a background of budgetary stringency. In this age of innovative ideas and technology, there is a growing need for new methods of communication. With all the astounding advances made in communications during the last two decades, one of the oldest and most effective mediums often has been overlooked--the telephone.

Since its invention over 100 years ago, the telephone has become quite literally a household word as a personal communications device. But the use of the telephone for education has been ignored for the last 20 years in favor of more glamorous media. Thus, it remains a virtually untapped natural resource for education.

However, this situation is changing fast. After many small scale experiments in the sixties, a second generation of educational telephone networks is now springing up both in North America and Europe.

The University of Wisconsin's Educational Telephone Network (ETN) helped revive the telephone as an educational tool. In 1965, ETN was born in Wisconsin, designed to meet the continuing education needs of medical doctors around the state. This two-way audio communication medium reaches into a large number of ETN learning centers located in court houses, extension offices, UW campuses and libraries throughout the state. Today, ETN provides an instant and personalized educational channel for more than 120 Wisconsin communities with over 200 specific listening locations. Enrollments for one year have reached more than 25,000, with an average cost of 25¢ per student contact hour.

Similar networks have been experimented with in recent years at Illinois, Quebec, Ohio, Oklahoma, Kansas and New York, to name just a few. Professional groups of all sorts are turning to the telephone as a delivery system used to provide in-service and continuing education training programs.

The telephone is an educational medium with growing uses and potentials, many of which are still undiscovered. And, of course, there are limitations and disadvantages, some known, some yet to be determined.

Therefore, the University of Wisconsin-Extension, in cooperation with the Universities of Quebec and Illinois, is offering a conference on "The Telephone in Education." It is the goal of this conference to bring about the exchange of information on this "new" medium of educational communication, to discover how the telephone can be tapped for educational needs. This conference is aimed to stimulate discussion among personnel of colleges, universities, industries and governments on the possibilities of educational teleconferencing in the next decade. Specific objectives are to:

--Report on the current status of teleconferencing technology.
--Position teleconferencing in education.
--Facilitate formal and informal exchange of information and experience among educators, technologists, industrialists and government officials.
--Stimulate decision makers in the development and implementation of educational applications.
--Explore future technological capabilities for teleconferencing.
--Suggest appropriate hardware and software development for teleconferencing.
--Stimulate discussion among teleconferencing educational practitioners.
--Identify the key factors of audio-interactive systems for successful instructional programs.

The conference and report do not pretend to be fully inclusive. They are intended, however, as a benchmark, a point of recording what has happened and providing an opportunity for educators to explore new educational learning styles that will meet the needs of students and communication systems of the future.

ACKNOWLEDGMENTS

Planning and organizing a conference involves the help of many people, and it would be impossible to list here all those who have had a hand in setting up "The Telephone in Education." However, I would like to acknowledge some of those who have worked particularly hard to help make this project a success.

Special thanks for early advice in planning the conference must go to the program planning committee: Ted Augustine, Dr. John S. Daniel and Dr. Edwin W. Vernon. Several institutions, too, played a significant role. The University of Illinois and the University of Quebec gave invaluable aid as co-sponsors of the conference, and the cooperation of Athabasca University, Carleton University and The Open University, Britain, has been greatly appreciated.

Of course, all those who wrote papers and prepared their manuscripts for this publication deserve many thanks. In addition, the staff of the Instructional Communications Systems merits a special note of appreciation for their assistance and encouragement.

Thanks also to Dean Luke F. Lamb, Educational Communications, and Mr. Arthur Krival, Chairperson, Communication Programs, for their continuing support in this project.

Finally, special thanks go to Judy Meyer for her patience, advice and clerical assistance in preparing this report.

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TELECONFERENCING AS AN EDUCATIONAL MEDIUM: A TEN YEAR PERSPECTIVE FROM THE UNIVERSITY OF WISCONSIN-EXTENSION

Dr. Lorne A. Parker
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"Mr. Watson come here, I want you."

Watson heard Mr. Bell's words over the wire and came running. That was the first message sent over the new device, the telephone, which, interestingly enough, began doing a useful communications job right from the start. Since that first successful call on March 10, 1876, perhaps no other single invention has had such a dramatic and positive influence on the lifestyle of Americans. And it continues to have impact 100 years after its inception as people are still finding new and exciting uses for the telephone.

Among those new uses is the concept of the telephone as an educational tool. Although the telephone has grown to be a mainstay of our personal and professional communication, it continues to be overlooked as an effective educational medium. During the past 20 years, its use for teaching has been limited in favor of more glamorous media, and the telephone has remained a virtually untapped natural resource for education.

Current demands on institutions of higher learning call for an immediate and well planned alteration in the traditional methods and ideas for extending the facilities of these schools to remote areas. These demands have forced administrators and educators to turn to the telephone, which is proving to be an excellent educational tool. Convincing people that the telephone can be the basis of a viable learning system has not always been an easy job, and perhaps those who are skeptical should take a lesson on the dangers of underestimating the telephone from the Western Union committee which was commissioned to evaluate the potential of Bell's invention . . .

"Alexander Graham Bell sees for the telephone a vast future as a means of personal communication by voice. He actually believes that one day they will be installed in every residence and place of business. This fellow Bell's profession is that of a voice teacher and particularly a teacher of the deaf. He appears to have had no previous experience with any other form of communication, electronic or otherwise; yet he claims to have discovered a concept which has been overlooked by hundreds of experts who have spent years in this particular field.

"Bell's proposal to place his instrument in every home and business is, of course, fantastic in view of the capital costs involved in installing endless numbers of wires.

"Bell expects that the individual home owners will use his instruments without the aid of trained operators. This is ridiculous, of course, Obviously the public cannot be trusted to handle technical communications equipment. Furthermore, when making a call, the subscriber must give the number verbally to the operator, who will have to deal with persons who may be illiterate, speak with lisps or stammer, have foreign accents, or who may be sleepy or intoxicated when making a call.

"Bell expects that the subscribers to his service will actually pay for each call made, and that they will agree to pay a monthly minimum if no calls are made. We feel it is unlikely that any substantial number of people will ever buy such a concept in view of the fact that there are telegraph offices now giving efficient round-the-clock service in every neighborhood, in even the smallest towns.

"In conclusion, the committee feels that it must advise against any investment by Western Union in Bell's scheme. We do not doubt that it might find a few users in special circumstances such as between the bridge of a ship and the engine rooms, but any development of the kind and scale which Bell so fondly imagines, is utterly out of the question."[1]

Of course Bell's telephone device went on to become the backbone of the world's largest company while Western Union is now struggling for a product. Fortunately, Extension administrators at the University of Wisconsin did not show the same lack of confidence in the potential of the telephone as did Western Union. The changing demands of education stimulated the University of Wisconsin-Extension to develop new educational communications systems to provide students throughout the state easy access to the campus.

Among the problems concerned with off-campus teaching is the number of hours spent by instructors traveling from the resident campus to the off-campus class. Often an instructor would spend more hours on the highway than in the classroom. To help alleviate this problem, the UW Extension developed two new educational communications systems. The Educational Telephone Network (ETN) was initiated in 1965 as a means to expand educational opportunities to Wisconsin residents at a minimal cost. Another statewide communications system called SEEN was developed five years later. SEEN, the Statewide Extension Education Network, is a two way network that offers visual as well as aural communication. These two systems, ETN and SEEN, have been combined within one administrative unit, Instructional Communications Systems.

Educational Telephone Network (ETN)

ETN, as the Network is known in Wisconsin, is a 4-wire dedicated telephone network that takes the form of a huge party line. The two-way interactive medium reaches into ETN learning centers in courthouses, extension offices, University of Wisconsin campuses, libraries and hospitals. The network interconnects 200 locations allowing University of Wisconsin

Extension faculty to reach 120 different Wisconsin communities simultaneously. Students at any one of the ETN locations listen to a lecture or panel discussion, ask questions, and exchange observations with fellow students at any of the other locations connected to the system.

Statewide Extension Education Network (SEEN)

SEEN combines a 4-wire telephone system similar to the ETN system with an electrowriter which permits the transmission, reception and projection of diagrams, formulae, outlines, in short, any line drawing which customarily could be made and displayed on a classroom chalkboard. The SEEN system allows the teacher at any one of 23 locations to instruct the class, which is located in widely scattered areas about the state. Each remote location instantaneously receives both written and voice communication from the instructor. In addition, each student in the off-campus class is able to talk with the teacher and classmates.

These systems, which enable residents around Wisconsin to benefit from the educational opportunities found at their state university, will be examined at length later in this paper. First however, it seems beneficial to consider how these networks grew from the original, innovative concept of the use of the telephone for outreach education to the reality of ETN and SEEN.

A Brief History

The University of Wisconsin has a long tradition of providing educational opportunities to students in their home communities. In 1907, Charles Van Hise, then president of the university, challenged educators to extend "the boundaries of the campus to the boundaries of the state." This, the Wisconsin Idea, has been applied successfully to education. It has lived and grown through the years and is the basic philosophy behind the implementation of the two communications systems mentioned above.

Education via telephone, not as a network, began in Wisconsin as far back as 1962, when the University at Madison presented a science lecture to students at La Crosse. Much earlier examples of such point-to-point use of the amplified telephone messages in education could be found in other parts of the country. Actually, the idea of using the telephone for teaching was conceived in the early 1950's. Before that, attention was focused on teaching students how to use the telephone. ETN was established in 1965, by the Department of Postgraduate Medicine, after an unsuccessful try at using a two-way radio for statewide educational conferences for doctors. One of the doctor's big problems is fulfilling his moral responsibility to his patients and keeping up with current events in medicine at the same time. There are so many demands on a doctor's time that taking a day off for education often becomes an impossibility. ETN helped provide the highest caliber of medical instruction at a low cost, while incorporating topics directly applicable to clinical practice and presenting programs on a continuing basis in doctors' home communities.

Started With Conference Calls

From November, 1965, through February 15, 1966, general medical conferences were conducted over a traditional telephone conference circuit. An operator called in each station fifteen minutes prior to the program time and established the network. At the conclusion of the hour, the network was disconnected.

Original Programs

The first program consisted of a thirty-minute lecture that was tape recorded in advance. The lecturer provided an outline of his/her lecture along with the visual materials to be used. These materials were duplicated on 35 mm. slides. Sets of slides were loaded into cartridges for projection at stations in the network. The slides and copies of program materials were mailed to each conference location a week in advance of the program.

At the time of the program, the recorded lecture was transmitted over the network. The format was modeled after the system developed by Dr. Frank Woolsey and his associates at Albany Medical College for use on their two-way radio conferences. The lecture, at the appropriate time, called for the slides, which were shown at each conference station. After the lecture each station was called in a predetermined order so that listening physicians, through a moderator, could question the lecturer or comment on his presentation. All questions and answers were heard over the entire network.

The "Gee Whiz It Works" Stage

Despite the lengthy setup time, the cost, and the various interruptions, the telephone system was an unexpected success. With this shakey but determined beginning, Postgraduate Medicine took the first step toward a brand new form of continuing education. With support from far-sighted Extension administration and the dedication of medical educators, the lines of the huge Educational Telephone Network were leased from February to May of 1966.

In February, medical conferences were conducted over the network of private telephone lines leased on a full time basis for teaching purposes. This eliminated the need for operators, switchboards and other equipment, and greatly reduced the potential for equipment malfunctions or personnel error. Initially, there were 18 stations scattered throughout the state. The station closest to Madison was approximately 30 miles away; the farthest, 350. There were 190 physicians enrolled at a cost of approximately $2.00 per person per hour. At the same time, University Extension employed a fulltime specialist to develop the network for educational use with other Extension programs.

Reactions to the first few programs varied. Some people thought ETN would never last the year. Others were excited about its great potential, while still others waited on the fringes in mild curiosity. When medical educators made the first leased-line telephone network presentation, the number of stations had increased to 27, and nearly 3000 doctors were participating. Could it really work? Extension nurses thought it could. Only the second group to join, they offered an experimental series of 12 programs, beginning in February, 1966. Pharmacy joined the users in the spring of the same year. With the help of the department of Postgraduate Medicine, the School of Social Workers and Extension Veterinary Medicine also used ETN that spring. The lease expired the last day of April, but a substantial gain had been made in ETN use, and the doubters were few. During that first attempt at telephone teaching, 67 presentations had been made to 1,970 clients.

In the fall of 1966, the network was leased for another nine months, and half a dozen more Extension units made their impact felt on ETN. In 1967, ETN not only expanded in the number of locations, but in the diversification of its programs, which started with Chancellor Donald McNeil's University Extension faculty meeting via ETN. Extension people looked forward to the next year with renewed vigor and eager optimism, and they were not disappointed. Requests for the use of ETN were growing daily. It seemed that everybody wanted to make at least one presentation on the network. With programs ranging from English, physics and sociology to touristry and horticulture, one department after another clambered on the ETN bandwagon. By the 1968-69 season, 982 programs were presented to 80,000 participants at 121 stations around Wisconsin.

Program Format

Most of the ETN programs offered during the developmental stage were continuing education or noncredit. Then departments such as library science and education began presenting graduate level courses for credit on ETN.

The format of the ETN programs was mainly one of lectures or panel discussion, followed by question and answer sessions. Lectures were usually live, but some were prerecorded. Programs varied in length from 30 minutes to two hours. Visual material was sent to each listening station for many of the ETN programs. These materials, usually slides, were projected on a screen in conjunction with the lectures. Film strips, printed materials and transparencies were also used.

Faculty continued to experiment with the new statewide instructional system. Glenn Barquest, a 4-H Woodworking specialist, succeeded in an ambitious attempt to teach exterior wood finishing to 4-H key leaders on the ETN system. During the session, 4-H leaders watched 35 mm. slides, reviewed step-by-step procedures, and examined sandpaper and wood samples referred to by Barquest. The leaders created wood stains by mixing pigments, oils and solvents, and applied them to the wood samples which had been sent out to each student.

Before the presentation, Barquest had recruited a group leader at each location who was responsible for the meeting room and its facilities, for obtaining materials necessary for the demonstration, and for relaying the questions and comments of his group during discussion.

With the success of teaching woodworking via telephone, the instructor was able to spend more time teaching and less for travel, thus enabling him to rapidly increase 4-H woodworking leader training throughout the state.

Crossing State Boundaries

Although ETN was located only in the state of Wisconsin, faculty found it could be linked with any other city in the country. A person in New York, Chicago or San Francisco could be connected to the entire ETN system. Such a hook up was made between a National Social Workers convention in San Francisco and ten ETN stations in Wisconsin. The audience in Wisconsin could hear and respond to lecturers in San Francisco as well as to one another. The programs were an exciting success.

An Economic Plan

To illustrate the economics of the network, the statistics from a statewide conference held in 1967 by Chancellor Donald McNeil are impressive. Over 418 Extension workers participated at 42 ETN sites around the state. No one drove farther than 88 miles round trip for the conference, and the average round trip was about 55 miles. Many had no driving to do as installations were in or near their offices. The total distance driven by all participants was about 1,700 miles, which, at 7¢ each, would have cost around $120. Had the meeting been held in Madison, these 400 people would have driven about 20,600 miles at a cost of close to $1,500.[2]

Establishment of Operational Procedures for ETN

Statewide Extension faculty agreed that the telephone system was an excellent and economical delivery system, but policy and operational procedures had to be developed to insure quality, and implementation factors of the program had to be taken into account.

In order to provide an overall operational process for implementation and planning of the ETN programs throughout the state, a faculty advisory committee was appointed by J. Mitchell Mackey, Community Affairs Chairman, April 9, 1969, and headed by Prof. Leonard R. Anderson, Chairman, Monroe County Extension Office. The committee was representative of each district within the state, and included continuing education specialists, county agents, agricultural specialists and communication specialists. The committee's major objective was to provide an operational framework for ETN programs. Statewide programming faculty agreed that using the Educational Telephone Network effectively and providing quality education programs would necessitate proper timing and effective program coordination by programming departments and the Extension county faculty.

One of the first tasks put to the Anderson I Committee was the standardization of terms. The following list of terms was adopted to clarify further discussion of the ETN and SEEN systems:

1. Instructional Communications Systems (ICS) is a department in the Educational Communications Division, one of the six major divisions of University of Wisconsin-Extension. ICS is responsible for the entire ETN-SEEN operation, including design of programs, coordination between the programming departments and local program administrators, technical operations, engineering of the Educational Telephone Network and the Statewide Extension Education Network (SEEN) systems, program evaluation and general administrative functions.

2. Program department means the department or the person responsible for supplying the content and general organization of the ETN-SEEN program.

3. District Director is the person responsible for the supervision of the community programs facility located in the county. It is the responsibility of the District Director to administer the ETN-SEEN locations within his/her district. It is also the responsibility of the District Director to appoint a Local Program Administrator for each ETN-SEEN

listening facility located within his administrative district.

4. Local Program Administrator (LPA) is the District Director's designee to assume the responsibility of coordinating, promoting and administrating all programs to be transmitted by the ETN-SEEN systems at the particular designated listening locations. Each LPA is appointed yearly and notified by the District Director in writing. A list of LPA's is provided by each District Director to ICS by April of each year.

5. The studio moderator is the person responsible for conducting the ETN-SEEN programs, either from the campus Old Radio Hall Studio of the University of Wisconsin or from a predesignated location.

6. Local program convener is the person selected by the programming department and by the Local Program Administrator to assist with programs at the local level. The convener can have many roles such as identifying clientele for programs, assisting students in developing a familiarity with appropriate communications systems used and, in general, helping people obtain a positive educational experience.

7. The instructor might also double as the studio moderator but is mainly responsible for the delivery of the program content.

Another duty of the committee was to make recommendations for programming procedures for the telephone network. Their suggestions included the following procedures:

1. A centralized registration should be established to allow Community Programs faculty to know prior to an ETN program how many students were going to be enrolled.

2. An Extension office chairman should be appointed as a Local Program Administrator of the ETN location.

3. The Local Program Administrator would then assist in determining program feasibility as it relates to the desires and needs of local clientele.

4. The Local Program Administrator would determine priorities for the use of county space needed to conduct ETN programs.

5. The publicity and promotional materials for an ETN program would be prepared by the programming department. Promotional materials would be supplied to the Local Program Administrator or his designate for distribution in the community.

Other recommendations included that a 60 day lead time be provided for all programs which required registration, and that all the programs planned on ETN be submitted to each Local Program Administrator prior to the semester offerings.

The series of recommendations was printed in an ETN program handbook which was distributed to all faculty members. In conjunction with the handbook, a series of faculty training programs were conducted in each district with various programming departments.

Acting on the Anderson Committee's recommendations was probably the most significant step toward the total development of the Educational Telephone Network. The committee had the foresight and the ingenuity not only to make recommendations, but to make sure that they were implemented and reevaluated as problems occurred. This committee realized that future classrooms could take many forms. They knew that good teachers for adults can be used constructively to reach many people throughout the state and that mediated instruction can be constantly improved through research.

New Era

So the system worked. Now students were asking for a quality system and quality programs. Faculty members began placing greater demands on the system by coming up with creative uses for the network. The growth of ETN was quick, but it would take time to develop the system and techniques necessary to insure high quality education. Since the initial Anderson Committee had been so successful, an Anderson 2 Committee was appointed.

Dean's Advisory Committee

The Dean's Advisory Committee (better known as the Anderson 2 Committee) was appointed by Dean Luke F. Lamb, Educational Communications, UWEX, to explore and re-examine previous guidelines for the ETN-SEEN operations. The committee was to look into five defined areas: 1. program design, 2. publicity and promotion, 3. technical system, 4. learning centers, and 5. operational procedures. To facilitate the study of these topics, subcommittees were formed with committee members volunteering to serve in the areas of their special interest. One advantage of having broad faculty representation on a major programmatic advisory committee is that members can be responsible for discussing recommendations within their respective disciplines. Thus a diversified response is gained from potential users and facilitators of the communication systems.

One of the basic assumptions behind the programming on ETN and SEEN is that a team effort must be made by the department doing the program, the Community Programs Division and educational media specialists. Only through a cooperative effort of all units and faculty members will students throughout the state benefit from these systems.

Each of the recommendations offered by the committee was approved by the administration and provided a basis for the development of a handbook on procedures, program design, promotion, publicity, and operation of the Instructional Communications Systems.

Specific committee recommendations are incorporated in other portions of this paper which are being given by other members of the Instructional Communications Systems faculty. I certainly do not intend to repeat their remarks, but it should be pointed out that the Anderson 2 Committee served as a springboard for faculty, administration and students to explore and develop a new improved Educational Telephone Network and station and conferencing equipment. Immediate effects of the Anderson Committees could be summarized in the following way:

1. The committees made sound realistic programming recommendations.

2. They provided a mechanism to make faculty aware of the intricacies involved in programming on a teleconferencing system.

3. The committees reinforced the Extension instructional program teamwork concept, which joined subject matter specialists with Community Extension Faculty and communications specialists, to work together to provide quality, efficient educational programs for people throughout the state.

4. They developed pragmatic guidelines for the effective use of teleconferencing systems.

5. These committees served as an awareness stage for Extension administrators, providing an overall plan for the administration to appropriately budget for the improvement of the systems.

6. They provided a system for in-depth involvement of outside expertise, such as telephone company personnel and state communities, to assist in the overall improvement of programs through technical systems and program design.

7. The committees provided a basis for the development of new and improved technical communication systems.

The Anderson Advisory Committees established a strong foundation on which teleconferencing systems in Wisconsin could grow.

Wisconsin's Teleconferencing Systems Today

Within the positive atmosphere created by the Anderson Committees, Wisconsin's Educational Telephone Network has expanded in scope as well as size, and has been joined by a second communications system, the Statewide Extension Education Network. To establish the status of these two systems today, let us look at each network and its operations in turn.

ETN, as described earlier, is a 4-wire dedicated telephone network which reaches into a large number of learning centers throughout the state. Today ETN provides an instant and personalized educational channel for more than 120 Wisconsin communities with over 200 specific listening locations. Enrollments for one year have reached more than 25,000.

Station Equipment

All the listening stations on the network have identical equipment. ETN uses a new communications unit, the Edu-Com, which was developed by Darome, Inc., Harvard, Illinois, along with the University of Wisconsin and the Wisconsin Telephone Company. The Darome Edu-Com is a portable, self-contained unit consisting of a large speaker and four microphones. The unit plugs into a standard telephone connector and AC power outlet. No technical skill or knowledge is required to operate the equipment.

Instructors may broadcast programs from any ETN location in the state or from the ETN studios located in Old Radio Hall on the University of Wisconsin-Madison campus. Anyone at a participating ETN location can be heard by all other linked locations by simply pressing and holding the lever on the base on a microphone and speaking.

The Edu-Com units were designed to be used by groups of up to 200 people. When the group is that large and a student has a question, the unit automatically turns into a public address unit at the location where the question originates.

Programs on the Educational Telephone Network System in Wisconsin

From the 18 locations participating in the original postgraduate medicine program, ETN has grown to accommodate many more listening locations and diversified programs. Programs now range from the original medical sessions to include pharmacy, English, law, social work, home economics, library science, education, nursing, physics, agriculture and engineering. The list goes on and on. Programs are essentially noncredit continuing education for professional adults throughout Wisconsin, but some credit courses are also offered. In addition, 4-H programs, extension faculty conferences and departmental staff meetings are carried effectively by this system. All of these programs vary from one to three hours in length and feature a variety of formats.

The Cost of the Educational Telephone Network System

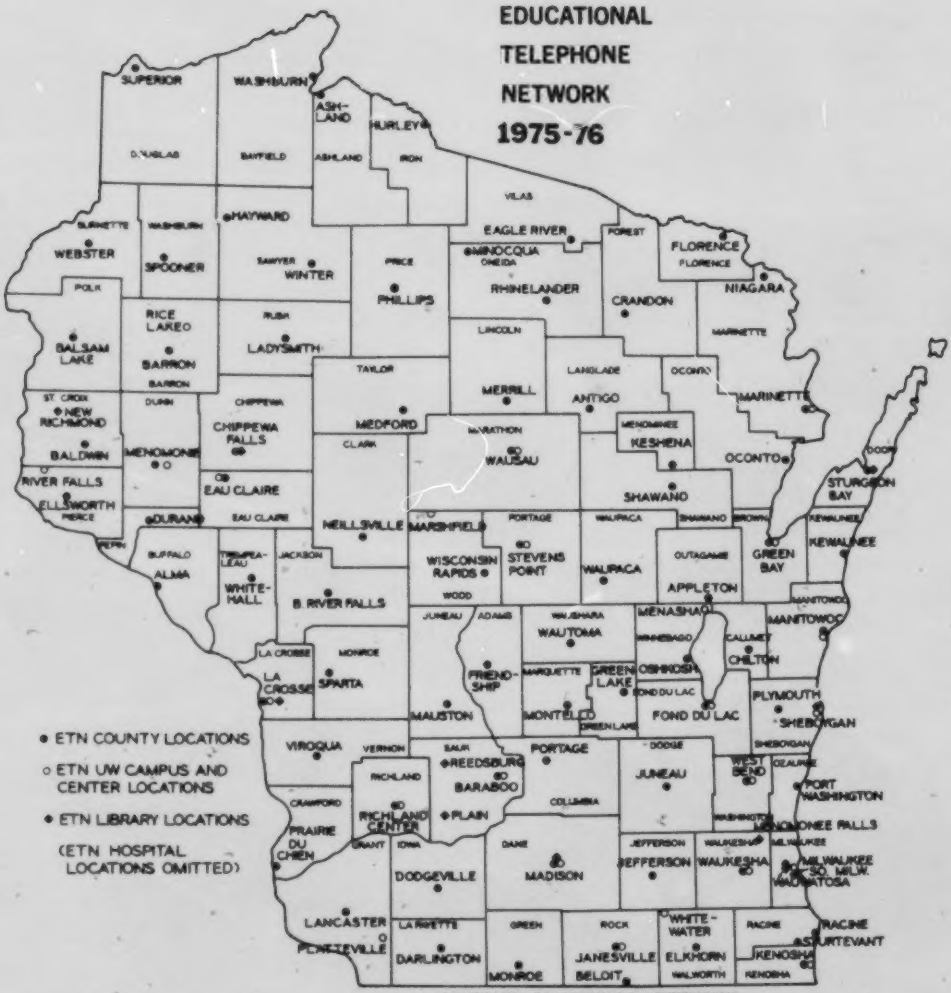
Educational programming over the ETN system has evolved into one of the most important activities of many University of Wisconsin-Extension programming departments. And, the cost is minimal: cost per instructional hour for noncredit programs transmitted via ETN averages about 25 cents per student contact hour. This amount reflects the rental of the telephone system and payment of station equipment and its operation. It does not include the instructional materials used in a course or an instructor's time. The cost is determined by the total operating budget for Instructional Communications Systems, the unit administratively responsible for the ETN system.

Teaching Effectiveness Via the Telephone

But economy is not the sole factor involved in evaluating ETN. In the past ten years several studies have analyzed the effects of amplified telephone systems on learning. The research on teaching via the telephone is rather extensive, and seems to support the view that, with proper design of program materials, the telephone is an effective, inexpensive educational communication channel.

Most investigations on telelecture have centered around comparison of face-to-face lecture to remote telelectures. Studies include all types of subject matter such as: graduate courses (Hartje, 1973); undergrad credit (Hoyt & Frye, 1972, and Zimmerman, 1970); teacher education extension courses (Blackwood & Trent, 1968, and Pellett, 1970); formal adult instruction at places of business with the instructor rotating his appearance among the locations, (Gold, 1973); and art education (Jesser & Clarke, 1966). As early as 1963, Beattie and Frick reported that high school American history had been taught by a college professor via a telelecture system.

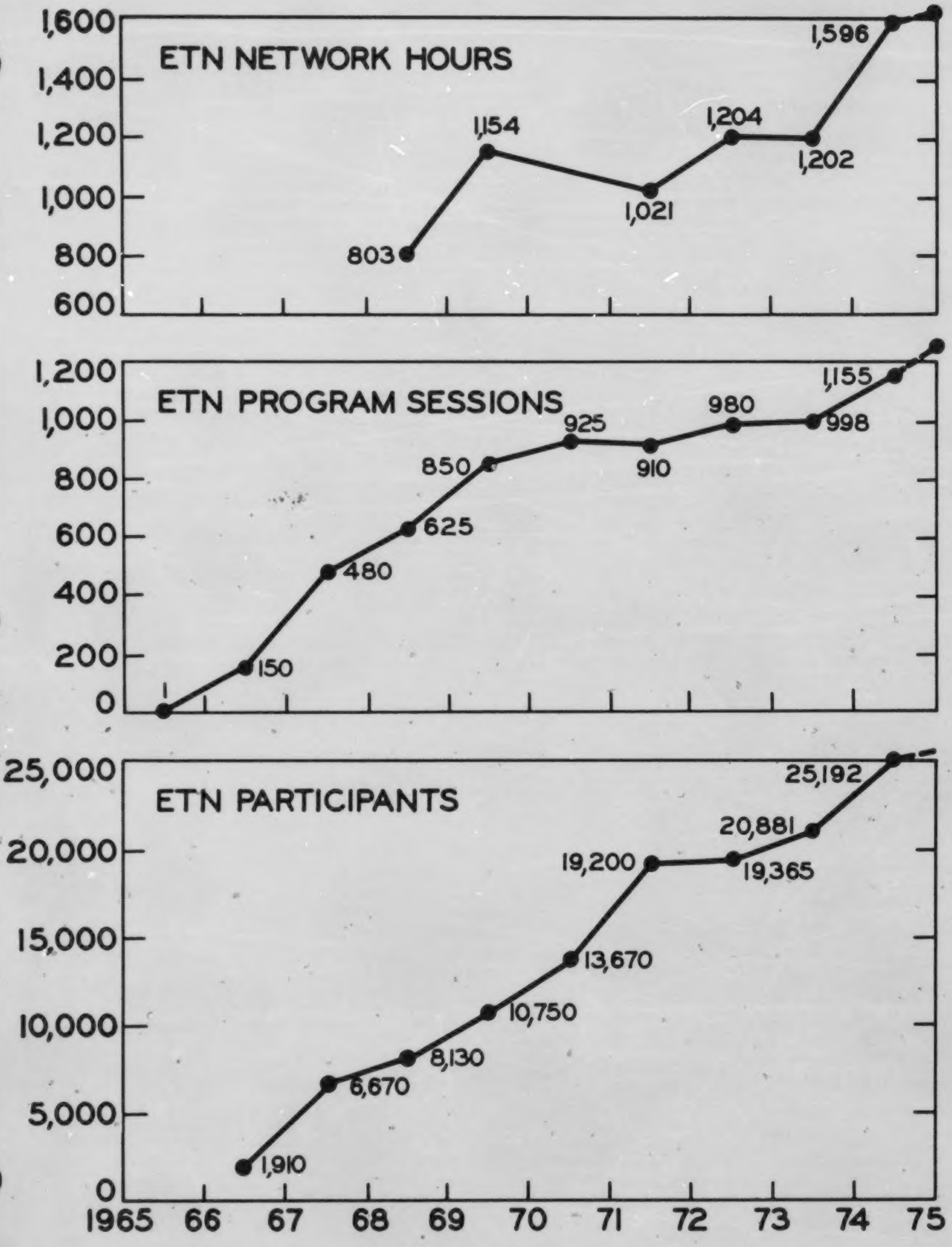
All the studies indicated that telephone classes were as successful as face-to-face classes, or that the telephone was capable of being used for effective education. Following are brief summaries of some of the more revealing studies.



EDUCATIONAL TELEPHONE NETWORK 1975-76

SUPERIOR
WASHBURN
ASHLAND
HURLEY
DOUGLAS
BAYFIELD
IRON
VILAS
BURNETT
WASHBURN
HAYWARD
WEBSTER
SPOONER
SAWYER
WINTER
PRICE
PHILLIPS
EAGLE RIVER
MINOCQUA
ONEIDA
RHINELANDER
FOREST
FLORENCE
NIAGARA
CRANDON
MARINETTE
POLK
RICE LAKE
BALSAM LAKE
BARRON
RUSK
LADYSMITH
LINCOLN
TAYLOR
MERRILL
LANGLADE
ANTIGO
OCONTO
ST. CROIX
NEW RICHMOND
DUNN
CHIPPEWA
CHIPPEWA FALLS
MEDFORD
MARATHON
WAUSAU
MENOMINEE
KESHENA
BALDWIN
MENOMONIE
CLARK
DOOR
STURGEON BAY
RIVER FALLS
EAU CLAIRE
SHAWANO
ELLSWORTH
PIERCE
DURAND
PEPIN
NEILLSVILLE
MARSHFIELD
PORTAGE
WAUPACA
BROWN
KEWAUNEE
BUFFALO
ALMA
TREMPEALEAU
JACKSON
WHITEHALL
WISCONSIN RAPIDS
STEVENS POINT
OUTAGAMIE
GREEN BAY
APPLETON
B. RIVER FALLS
WOOD
JUNEAU
ADAMS
WAUSHARA
WAUTOMA
MENASHA
MANITOWOC
LA CROSSE
MONROE
SPARTA
FRIENDSHIP
MARQUETTE
GREEN LAKE
WINNEBAGO
OSHKOSH
CALUMET
CHILTON
MAUSTON
MONTELLO
FOND DU LAC
PLYMOUTH
SHEBOYGAN
VIROQUA
VERNON
SAUK
REEDSBURG
BARABOO
PORTAGE
DODGE
JUNEAU
WEST BEND
OZAUKEE
PORT WASHINGTON
RICHLAND
RICHLAND CENTER
PLAIN
COLUMBIA
WASHINGTON
MENOMONEE FALLS
CRAWFORD
PRAIRIE DU CHIEN
GRANT
IOWA
DANE
MADISON
JEFFERSON
WAUKESHA
MILWAUKEE
SO. MILW.
WAUWATOSA
DODGEVILLE
LANCASTER
LAFAYETTE
GREEN
ROCK
WHITEWATER
RACINE
STURTEVANT
PLATTEVILLE
DARLINGTON
MONROE
JANESVILLE
BELOIT
ELKHORN
WALWORTH
KENOSHA
● ETN COUNTY LOCATIONS
○ ETN UW CAMPUS AND CENTER LOCATIONS
◆ ETN LIBRARY LOCATIONS
(ETN HOSPITAL LOCATIONS OMITTED)

UNIVERSITY OF WISCONSIN-EXTENSION
INSTRUCTIONAL COMMUNICATIONS SYSTEMS


ETN NETWORK HOURS
1,600
1,400
1,200
1,000
800
600
803
1,154
1,021
1,204
1,202
1,596
ETN PROGRAM SESSIONS
1,200
1,000
800
600
400
200
0
150
480
625
850
925
910
980
998
1,155
ETN PARTICIPANTS
25,000
20,000
15,000
10,000
5,000
0
1,910
6,670
8,130
10,750
13,670
19,200
19,365
20,881
25,192
1965
66
67
68
69
70
71
72
73
74
75

Feedback--Discussion. Etzioni (1972) indicated that a real strength of the telephone for education is that it provides a mechanism for real-time dialogue between geographically dispersed groups and continuous feedback between students and instructor.

Sharing Resources. At a time when most educators are looking for quality educational resources at the lowest possible cost, Parraton (1969) indicates that a telephone lecture network can provide a vehicle for universities to share information and instructors.

Effective Use of Telelectures. Puzzuoli (1970) suggests that telelecture teaching is more effective when the professor limits continuous lecturing to 20-25 minutes, provides printed material, uses audiovisual techniques as a supplement, makes a number of personal visits to the remote locations and bases the class on problem-solving techniques.

Limitations of Non-Visual Two-Way Transmission

As research and 10 years of Wisconsin's ETN programming experiences have shown, the two-way channel can be a highly effective means of reaching statewide clientele. The system has many other strengths: it is a truly continuing education medium open for all; it is a time and money saver for those who instruct courses and for those who attend; it can reach entirely new audiences in the state; it can reach isolated professionals; and it can be a vehicle for universities and other institutions to share resources. However, we also need to shift gears briefly and look at the other side, the inherent limitations of non-visual, two-way audio transmission. Subject matter specialists who use the ETN system need not only to understand the system and its capabilities, but also to respect its limitations.

STUDENTS HEAR FELLOW CLASS MEMBERS AND INSTRUCTORS through the speaker at their locations and use the microphones to ask questions or make comments heard by all their classmates. No technical skill is needed to operate the classroom equipment. Each ETN classroom has a DAROME Edu-Com unit consisting of a speaker and four microphones that link students and their instructor. Additional microphones and speakers can be added by plugging them into the base unit.

It's Hard Making A Listening Group a "Group." One limitation of a system like ETN is that, when 165 people are scattered all around the state at some 50 different ETN locations, it's hard to make the listening group a "group" and not just a collection of strangers. It is hard, but with extra effort on the part of the instructor a current of group feeling and rapport can be created.

--it can be as simple as an instructor always calling his students by name when responding to their questions or comments. With a roster in front of him, this can be easily done.

--it can be an instructor travelling out into the state to various ETN locations to originate some of his programs and then visiting students in their work situations for an hour or two following the lecture.

--or it can be as simple as an ETN-O-Gram, a half sheet of paper on which students are invited to share information with or ask questions of an instructor if the ETN program time happens to run out. It's simply a device to let students all around the state know that no matter how many miles separate them, two-way communication channels are always open.

Discussion Doesn't Just Happen. A second limitation of two-way audio transmission is that adults like to get actively involved in the learning process. That desire for two-way communication, between students and instructors and among students, is the basic justification of ETN's existence. However, no matter how much adults want that opportunity and no matter how easy it is technically, instructors often have to work at getting discussion started.

The new learning environment of an ETN program and the ETN equipment are usually only first evening barriers with most students. There are other reasons why they may be reluctant; some may feel they're infringing on precious program time, other student's time, or that their question or comment may not be worded right. On the other hand, students may be more inclined to ask questions on a telephone system than in a normal classroom situation.

Discussion via ETN may take extra instructor effort to get it going and might need to be continu-

A STUDENT WILL HEAR all 200 locations interconnected on the ETN system, and, by simply pressing the push-to-activate bar on the microphone, the student's voice is transmitted through a "public address" system so that all students within the same room will hear the conversation.

ally reinforced during the program. That effort can include such things as an instructor asking students to fill out an identification card so that he can learn something more about a student than his name. He can use this information to draw upon students' personal experiences and help lead them into discussion.

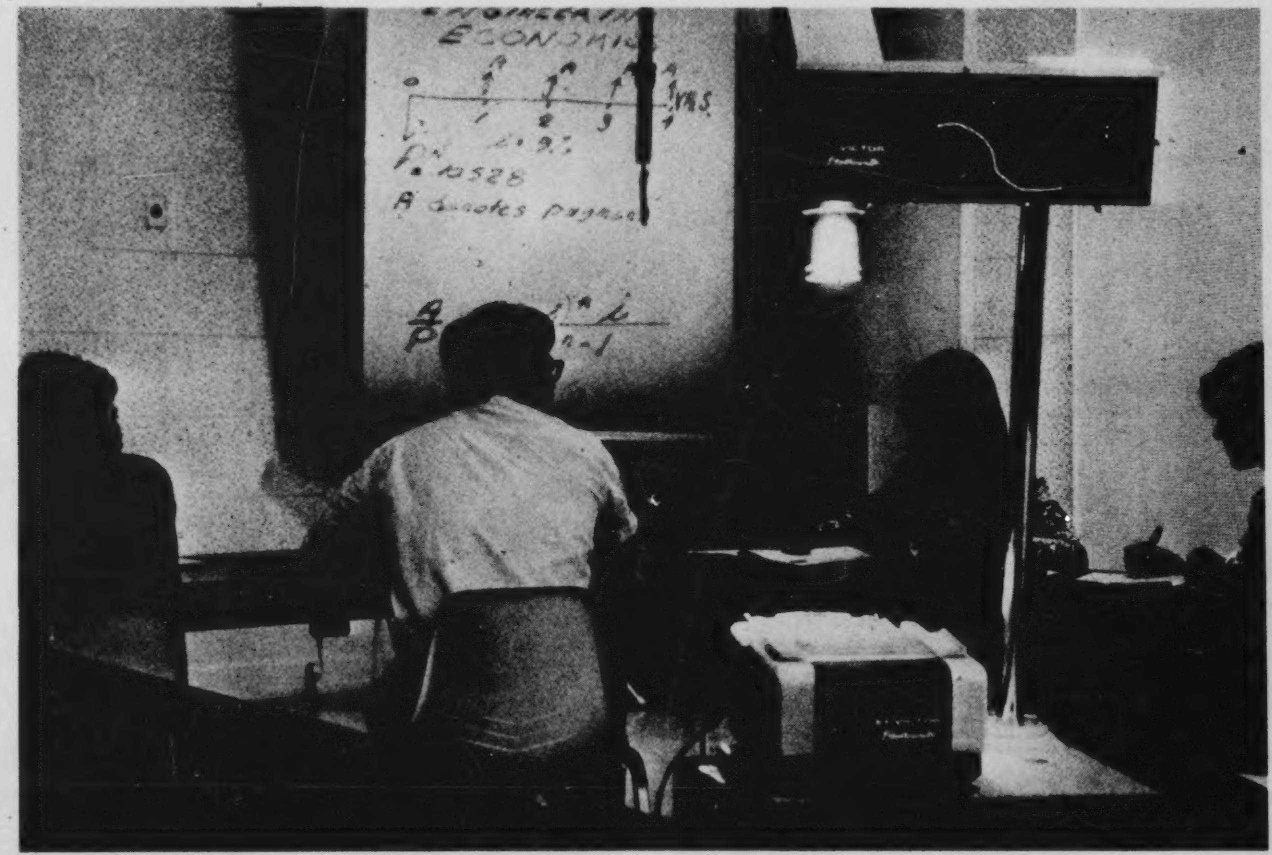
SEEN

The limitation of a purely audio communication system was one reason for the initiation of SEEN, the Statewide Extension Education Network. Because the Educational Telephone Network offered the possibility of communicating only oral information on a two-way basis, the Extension Engineering faculty saw serious drawbacks in trying to teach their courses via this system. Major portions of engineering lectures and discussions involve the use of mathematical equations or other graphic information. Even though the economies of ETN were beneficial, engineering faculty could give little serious consideration to teaching their courses over this system until technology came to the rescue.

In 1969, the electrowriter was added to ten ETN locations and was an immediate success. Students and their instructors liked the system and its potential. An exchange of electrowriter courses was soon developed between Wisconsin and the University of Illinois. The scheduling of Wisconsin and Illinois courses proved to be difficult due to the number of other programs carried over ETN and necessitated the installation of a separate electrowriter network, SEEN.

UWEX's Statewide Extension Education Network is an educational system that provides instructional programs via telephone, offering visual as well as two-way aural communications.

When SEEN was initiated by Extension Engineering in 1970, it distributed courses to locations which serve 80% of the Wisconsin population. In 1972, Instructional Communications Systems was charged with the administration, coordination and operation of the Statewide Extension Education Network, thus permitting the use of the network by any department within the UW system. Through the use of SEEN, the University programming departments are able to meet

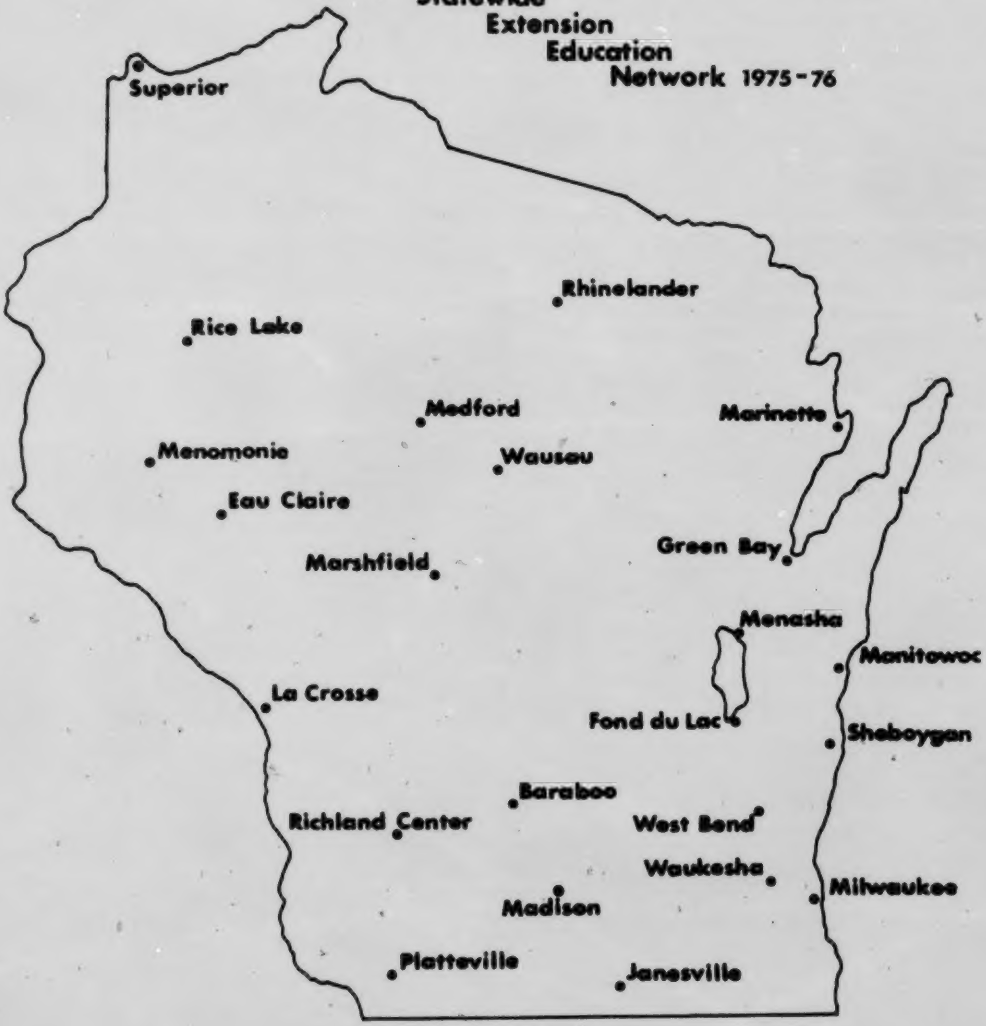


SEEN IS A 4-WIRE TELEPHONE PARTY LINE allowing for instantaneous two-way communication. Students at all locations are able to view the material exactly as it is created by the instructor and may respond or ask questions at any time during the presentation by simply speaking into one of the microphones provided in the classroom.

UNIVERSITY OF WISCONSIN–EXTENSION

INSTRUCTIONAL COMMUNICATIONS SYSTEMS

Statewide Extension Education Network 1975-76


Superior
Rhinelander
Rice Lake
Medford
Marinette
Menomonie
Wausau
Eau Claire
Green Bay
Marshfield
Menasha
Manitowoc
La Crosse
Fond du Lac
Sheboygan
Baraboo
Richland Center
West Bend
Waukesha
Milwaukee
Madison
Platteville
Janesville

educational needs of many adults who previously could not be served with credit and continuing education programs in the state.

The Technical System

The audio portion of the SEEN network is a 4-wire telephone "partyline" similar to the ETN system that is used for instantaneous two-way interaction among students and instructor. The Darome Edu-Com, the station equipment used at each SEEN location, allows students to speak to each other easily via microphones.

In addition to the voice presentation and conversation, the Victor Comptometer Corporation Electrowriter permits the transmission, reception and projection of any line drawing which customarily could be made and displayed on a classroom chalkboard. Students at all the locations are able to view the material exactly as it is created by the instructor and may respond or ask questions anytime during the presentation.

Besides its instate network, SEEN is flexible enough to tie a telephone call from anywhere in the country into its system, thus providing instantaneous contact with experts in many disciplines.

Operation of the Electrowriter. The teacher or instructor writes on an electrowriter transmitter with an ordinary ballpoint pen. Pen position and movement creates tone signals which are carried over regular telephone lines to electrowriter receivers in SEEN classrooms around the state. These signals are translated by the receiver into an instantaneous and faithful reproduction of the instructor's writing. The image on the receiver is then projected on a screen which becomes the classroom chalkboard. Thus, through the use of telephone lines, a teacher can write and speak to class members located in a number of widely separated classrooms.

Wisconsin Electrowriter System. Electrowriters came into existence in the early sixties, and their instructional applications began later in that decade. Victor Comptometer Company of Chicago, Illinois, generally is credited as being responsible for the development and marketing of electrowriters. The system marketed by that company for instructional applications is properly referred to as VERB (Victor Electronic Remote Blackboard).

VERB systems may be bought in several configurations depending on the intended applications. A basic system consists of a transmitter and receiver, each of which have a writing area of 17.5 square inches, and two telephone lines. The University of Wisconsin-Extension Instructional Communications modified the VERB units to double the writing and viewing area, making, in essence, a two frame system. When one frame is being developed by the instructor, students can see the additional frame which was previously developed and discussed.

Within the last four years many University of Wisconsin-Extension departments have programmed on the SEEN network using VERB and the two-way audio system to carry educational activities in just about every field. Although the SEEN network was initially installed to provide educational opportunities for engineers around the state, the system is now used to teach graduate and undergraduate courses in engineering, mathematics, agriculture, education and business. The system is also used for occasional on-campus instruction to bring in outstanding faculty members from other campuses. All the programs transmitted on the SEEN network are recorded on a professional audio recording machine. Courses can be played back through the development of a Polaroid Compensator allowing for the rerunning of courses for students who might have class time conflicts, or have missed programs.

Programming on ETN and SEEN

The needs of Wisconsin's medical doctors produced ETN, and the needs of Wisconsin's engineers produced SEEN. Now the systems meet the needs of a variety of professionals and nonprofessionals, providing public service programs and continuing education in a wide range of subject areas.

In general, there are four programming areas the networks are used for: Continuing Education, Administrative Programs, Public Service and Credit Courses.

Continuing Education

Continuing Education, the largest area, and the basis of the entire teleconferencing network, is directed to professional adults: doctors, lawyers, pharmacists, nurses, engineers, ministers, librarians, etc. Most of these courses are practical in nature. Librarians, for example, might take a course to keep them up-to-date on new cataloguing techniques.

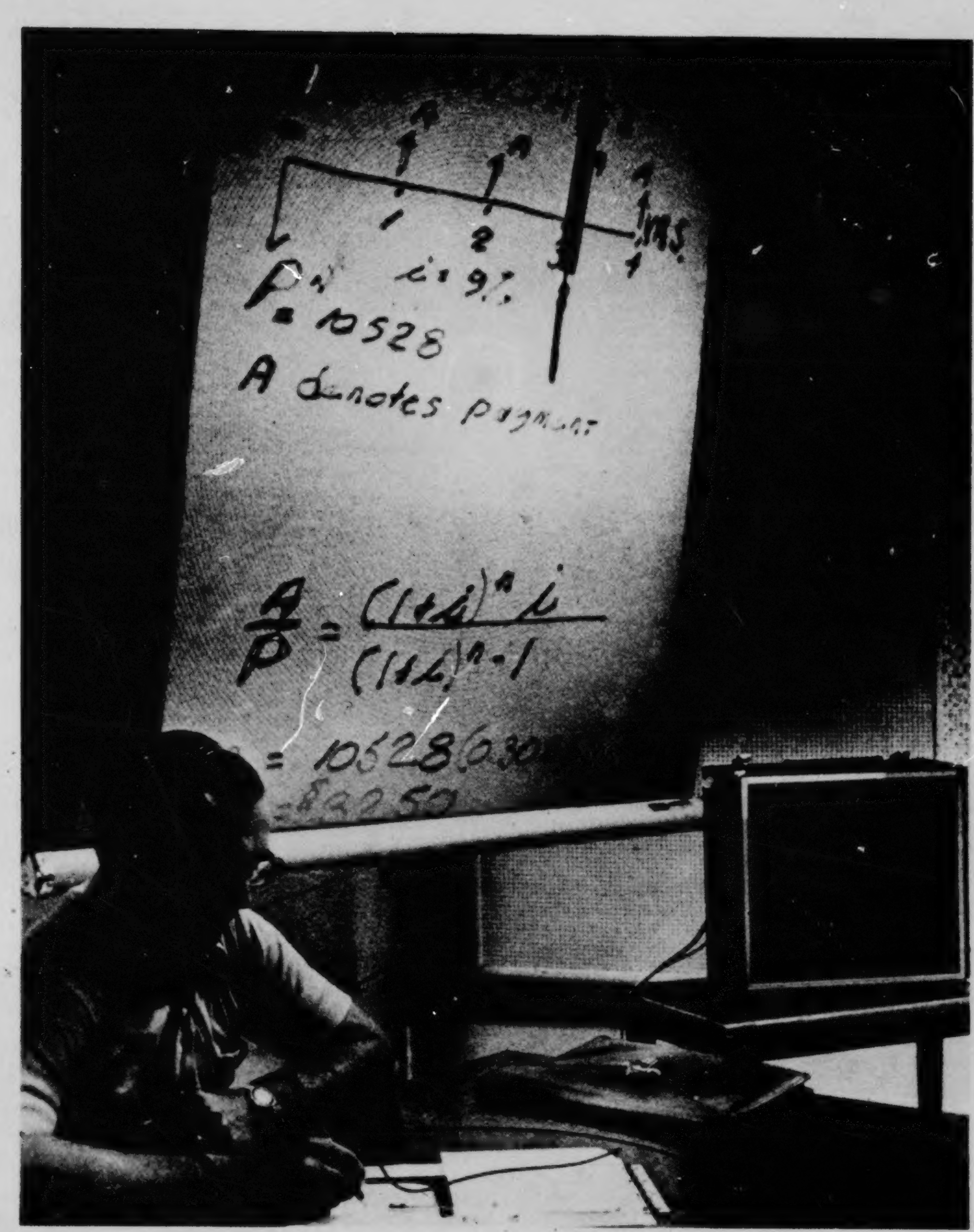
Aside from a voluntary interest in keeping professionally abreast of new developments, under Wisconsin's law, continuing education is mandated for certain professions. Lawyers will soon need 15 continuing education hours per year to retain licenses. Similarly, other professionals must receive a certain number of credits annually through university departments. These requirements put pressure on professionals to seek educational alternatives like the ETN and SEEN systems.

These systems are able to provide continuing education to an unexpected variety of clientele. ETN has finally invaded a most unlikely territory: piano teaching via the telephone. From the elegant, comfortable library in Cranbrook House in Michigan, pianist Gina Bachauer performed, discussed music and answered questions to a live audience of 200 piano teachers throughout the state of Wisconsin, none of whom had to drive more than a few miles to participate in the master class.

While Gina Bachauer performed Schumann's "Knderszen" and Moussorgskv's "Pictures at an Exhibition," participating piano teachers on the ETN system at some 70 locations followed along with music scores which they had brought along.

For only six dollars, a Wisconsin piano teacher could attend at one of the various locations in the state, and, by simply speaking into a microphone, could ask questions directly of the lecturer.

Preceding the Bachauer class, David Carr Glover lectured and answered questions for Wisconsin teachers from his own music studio in Portsmouth, Virginia. John Perry dealt with Beethoven's "Sonata Pathetique" from his bedroom in Austin, Texas. Talents of this caliber were interested in sharing their art with Wisconsin's piano teachers because no time was lost in travel, making the system attractively convenient.


1
2
3
4
yrs.
i = 9%
P = 10528
A denotes payment
A/P = (1+i)^n i / (1+i)^n - 1
= 10528(.30

AN INSTRUCTOR USING THE ELECTROWRITER writes with a special pen that permits the transmission, reception and projection of diagrams, formulae, outlines, or any line-drawn visual material which customarily would be displayed on a classroom chalkboard. The Wisconsin system modified the electrowriters, thus allowing a two-frame display shown above.

Yet piano teachers all over the state were able to benefit and be inspired by some of the greatest artists in piano playing and teaching of our time.

Public Service Programs

Public Service activities include offering general interest programs such as Family Estate and Financial Planning, Smoking Modification, Legal Rights and Responsibilities in Marriage and Divorce, and the like.

Programming in this category, however, often serves very specific purposes. With the recent changes in election laws and procedures, a program was developed for state election officials centering on the duties of election workers and their authorities and assistance to new voters. The program was able to instruct election officials on updated basic procedures and the State's new election manual that was recently approved by the State Legislature.

Another case in point is an ETN course in which 3500 plumbers enrolled to learn the new solid waste codes passed by the State Legislature. When the State moved from locally regulated codes which varied from county to county to a State Regulated Uniform Code, the law also required compulsory training for plumbers and county officials in interpretation of legislation and in implementation of the new code. The 3500 who attended the ETN classes in their county courthouses once a week received copies of the code to study in advance. In class over the telephone network they were able to ask various legislators who wrote the law to clarify points and answer questions.

For the State Department of Natural Resources which had contracted with University Extension to give the course, the telephone network was an effective way to bring new information to its clientele. Training was completed in less than two months, while the Department of Natural Resources estimated that, otherwise, it would have taken fourteen.

Credit Programs

A small portion of the total offerings of the ETN programs, some 5%, is designed for undergraduate and graduate credit. Many of these are education courses. The proportion of credit offerings is small because credit is readily available through traditional means. Most of the credit courses given on the ETN system are not duplicated on campuses, but are offered at the request of a number of students throughout the state.

Because most students enrolled in credit courses via the teleconferencing systems have not been exposed to nonconventional educational techniques, a training process is incorporated into the courses. To acclimate students to the system, the professor lectures from various ETN/SEEN centers, allowing each class around the state to participate in some live lectures. Lectures are transmitted by means of the regular ETN station equipment using a special remote microphone that plugs into each ETN Edu-Com station unit. The lecture is transmitted via ETN/SEEN to students at participating campuses. Slides, videotapes and 16 mm. films used in conjunction with lectures are mailed to each location in advance.

Although the telephone network offering of credit classes is not new in Wisconsin, it was an innovation to offer the same course simultaneously to additional campuses outside the State. Professor Burton Kreitlow taught a course in Adult Basic Education: Principles and Practices, to the Educational Telephone Network students in conjunction with a graduate class in Tuskegee, Alabama. Kreitlow indicated that he tried a few educational teaching techniques that worked well on the telephone network. The list includes:

1. Using resource persons on the network once or twice each semester.
2. Student led discussions.
3. Student oral responses to questions assigned in advance.

Through Dr. Kreitlow's experiences in teaching two courses on the telephone network, one interconnecting an additional class in Tuskegee, Alabama, he feels that the telephone network has a place in continuing education of adult educators and others where the number of those seeking credit classes is too few to be efficient on a one teacher per site ratio. To teach on a teleconferencing system requires many adjustments from the usual campus class, but it can be done. All educators need to give top priority to trying and perfecting new and efficient ways of reaching students, and teleconferencing should be at the forefront of those methods considered.

Administrative Uses of ETN

The ETN system has been used in many different ways. Each Monday morning at 9 o'clock, for example, Extension faculty and staff participate in a statewide meeting conducted by the Community Programs Department. Subjects discussed at these meetings range from current topics to a report from the President on the Board of Regents meeting.

Every morning at 8:30, messages from the University Extension Office in Madison are relayed to faculty around the state. Immediately following this exchange, the traffic is reversed, allowing agents to forward messages to the Madison office. Right after this message service each morning, the system is reserved for fifteen minutes so county extension agents can confer with each other. Sometimes they make prior arrangements for their discussions, but more often than not, you can hear a faculty member such as Herman Smith say, "This is Smith in Oneida County. Is Merrill on the line?" The chances are pretty good that Merrill is on the line, and Smith gets his message through.

Among its other uses, the ETN system links regional faculties for informational exchanges. It also links 4-H Club activities, and it provides county Extension faculty an opportunity to exchange weekly information with agricultural specialists. A program starting at 8 a.m. every Monday morning with agricultural specialists discussing current agricultural problems and solutions has proven to be a very popular in-service training and informational program for county faculty.

ETN has also been used to disseminate emergency information to agricultural agents. Recently, an outbreak of corn yellow leaf blight brought Extension plant pathologist Gayle Worf to the telephone network during a Monday morning staff conference with information for agricultural agents on the status of the disease and recommendations for its control.

As is readily apparent, the surface barely has been scratched in the development of teleconferencing as an educational media. With the proper planning and a little imagination, ETN and SEEN can meet a wide variety of educational and informational needs.

SEEN Programs

Unlike the Educational Telephone Network, SEEN offers more credit courses but still gives noncredit programs where professional engineers can obtain continuing education. In one instance, Clyde Crabb, Green Bay's Assistant Director of Public Works, used SEEN to borrow management expertise from specialists around the state. About a year ago, for ten weeks, he and Richard Hall, Traffic and Civil Engineer in Green Bay, used the system to consult regularly with specialists from the University of Wisconsin-Extension Department of Engineering. Crabb and Hall stayed close to their jobs and homes, and so did the specialists, 125 miles away. Despite the time and distance barrier between them, the consultation was easily accomplished over the University of Wisconsin-Extension's Statewide Extension Education Network.

The Subject: Public Works Management. SEEN, as was explained earlier, offers both audio and visual communication. Crabb, Hall and all other students around the state could view the material at their sites exactly as it was created by William R. Baker, class instructor, or one of his guest lecturers in Madison. Students could ask questions at anytime to any other student or instructor.

More than 70 people from all levels of the Public Works Operation and Planning Management participated in this SEEN course, which was given at Janesville, Wausau, Menasha and many other communities. All of these students were getting ahead in professional development, staying on their jobs and blending practical experience with study.

The SEEN system offers Wisconsin students a wide variety of undergraduate, graduate and continuing education courses each semester. Some of the SEEN programs are part of various continuing education Engineering studies offered by the Professional Development Degree Program in Engineering.

This unique, postbaccalaureate professional degree is administered jointly by the Faculty Committee of the College of Engineering, UW Madison, and the Department of Engineering, UW-Extension. Other noncredit offerings on SEEN include accounting, business management, art and education courses.

Graduate Credit--Business Education Course. The University of Wisconsin-Oshkosh Campus presented a basic foundations course for the MBA degree for a 2 1/2 hour period once a week. The Management Foundation course met for 16 weeks with 48 students and involved 10 locations in addition to the Oshkosh originating classroom. Management Foundations is a three credit course in a graduate curriculum which is completed by those who have no prior academic background in the Management area.

Economic Feasibility. With one instructor, 48 graduate students all over the state of Wisconsin were able to enroll in a Management Foundations course. While it is true that the instructor could handle this number on campus in one lecture at less cost, the fact is that only 16 students enrolled for the course at the Oshkosh campus, the principal sending station on the SEEN network. An additional 2/3 of the enrollment consisted of students who would have had to travel up to 100 miles to reach the Oshkosh campus.

The average cost for graduate instruction at the University of Wisconsin-Oshkosh School of Business Administration is approximately $55 per student credit. The average cost on the SEEN system is $9 per student contact hour or about $1.44 per student credit for a 16 week term.

Another economic factor, although not directly accountable to the school, is the student transportation cost. If students had to commute to Oshkosh from the 10 locations in this program, it probably would have made the cost prohibitive for most of the enrollees. Therefore, there was a larger gross enrollment than otherwise would have been the case. The school is ahead with a higher enrollment and the student is economically ahead by only having to travel a few miles to a SEEN receiving location.

Students' Academic Performance. Several students demographic characteristics were studied in relationship to the academic performance during a SEEN experiment course. Student ages ranged from 20 to over 40; several persons had little more than a high school diploma while one individual had credits above his Masters Degree. Fulltime business experience varied from none to over 15 years. Test score results on neither the mid-term nor the final showed any significant relationship with any of these variables. Similarly, when student test scores were analyzed according to class size and geographical location, no statistical difference was detected in their performance.

Finally, students were asked why they enrolled in the course, for example, to earn credit toward an MBA or for professional development. Once again, no evidence was found to support a hypothesis that SEEN is more beneficial for one particular kind of student. Therefore, SEEN seems to be applicable to a wide variety of students regardless of their backgrounds and goals.

Stimulated by the results of this graduate course in Management, there was a definite expansion of these types of program offerings which have been closely evaluated as they have developed.

Teleconferencing Evaluation Process

How a student-teacher relationship becomes a rich learning experience is a question that has intrigued researchers, curriculum designers and evaluators for decades. Put a telephone network and a few miles between student and teacher and the question is compounded: How should ETN programs be designed to provide the most fulfilling possible learning experience for all involved?

Discovering what's best for ETN program design is part of the process of evaluation. In order to evaluate ETN programs, two processes must be measured: communication and education. Like the chicken and the egg, the teaching methods and the medium of communication must be considered both as individual entities, and as interrelated factors contributing to the overall quality of the ETN educational process.

The Purpose of Evaluation

The purpose of evaluation is to determine the strengths and weaknesses of current programs so that improvements can be made in future program design. Changes in program design come about with an analysis of evaluation results by program coordinators, educational specialists and individual program lecturers. Through this exchange and analysis, the results of the evaluation can be built into the next learning experience.

This is the designated purpose of the evaluation for programs on the ETN and SEEN systems. The results are confidential and released only to the program coordinator. However, there are other peripheral benefits in conducting an evaluation. For one, it provides one additional channel of communication between the participants and the instructor. The evaluation is a tangible sign of interest in student opinion. This can be particularly meaningful for remote participants who have little contact with the home base of program origination.

Evaluation results are primarily a function of judging program effectiveness. In that process of judgement, the evaluation can stimulate consideration of overall goals and values in teaching. It is this stimulation that shapes the educational process and motivates improvement in educational quality.

The Development of the Evaluation Instrument

The Program Evaluation Checklist (PEC) is a systematic method of studying the profile of the adult participant and measuring the components of educational communication.

General Student and Program Information. This instrument collects certain demographic information such as age, sex and educational background. The individual program coordinator may specify any further information he/she may wish to obtain such as professional experience or occupation. These demographic variables are incorporated into the General Information portion of the evaluation. The data obtained constructs a student profile. It gives a present and future picture of target audiences for particular programs, and allows for a comparative analysis of various audience types' receptivity to teleconferencing programs.

Frequently, the General Information portion also asks if the audience has participated in ETN courses in the past and if they would be interested in future ETN programs. Experience with ETN programs will condition the participant's evaluation of the course, and his interest in future courses indicates modified reactions to the course.

Program Evaluation

There are essentially five steps in the original development of the evaluation checklist items. First, the critical expectations of ETN programs are identified. These are the programs objectives in the most general sense, i.e., the quality of student-teacher contact, scope, relevance and importance of subject matter, and the instructor's ability to tailor his/her teaching performance to an audio delivery system.

Second, course design must be broken down into various aspects which facilitate the ordering of data, and third, the objectives must be classified into these catagories. The following are the seven primary aspects and expectations with which the teleconferencing systems are concerned:

1. THE ENVIRONMENT--the arrangement of the physical facilities, seating, lighting, etc.
2. THE TECHNICAL COMPONENTS--the functioning of the mechanical components of the program
3. THE AUDIO-VISUAL MATERIALS--the use of auxiliary materials and equipment
4. THE PROGRAM AIDE'S BEHAVIOR--the performance of the persons responsible for the individual listening stations
5. THE LECTURER'S BEHAVIOR--the delivery of course material
6. THE PROGRAM ORGANIZATION--the involvement of the participants in the presentations and discussion of program content
7. THE PROGRAM INFLUENCE--the impact of the educational program upon the participants

Fourth, descriptor words for these categories are derived. The items as they appear on the evaluation are classified in six groups: 1) program facilities, 2) program lecturer, 3) organization, 4) program material, 5) program content, and 6) technical operations quality.

With these categories and descriptors formulated, course expectations are framed into positive, affirmative statements which describe the program from the student's point of view. These are the evaluation items. For example, "The material presented in this course can be applied to my present needs." This is followed by PM (program material). The preparation of the generalized descriptions of the principal program expectations (the items) is the fifth and final step of the evaluation.

At least five of these items are used for each of the seven program aspects. Usually there is one item at the end of each evaluation which asks for the participant's overall feelings toward the program, and frequently there is a space left for comments.

How the PEC Works - The Rating Scale

Each of these items are set against a rating scale. This rating scale is a systematic procedure for measurement which precludes the student's patience or writing ability, factors which often render an open-ended evaluation format invalid. Because of the geographic dispersion of the audience, evaluation by observation is impossible. The method of self-evaluation on a rating scale renders reliable data and allows for formulating conclusions about a program with a high degree of confidence. The data derived from its use is amenable to statistical analysis, and, as a research tool, it may be used repeatedly to test hypotheses in the field of educational communications.

The rating scale used is a ten-point ordinal scale which ranges from 0 to 9. With an ordinal rating scale, it is assumed that the intervals between numbers are psychologically equal from one number to the next, and the numbers increase in value in a systematic progression.

The ordinal rating scale provides an immediate conversion of audience responses to numerical values, so that responses need not be converted for computerization. When computerized, ordinal scales render means, percentiles and standards of deviation with reasonable reliability. These three statistical outputs are adequate to our purposes.

The ordinal scale also allows for a satisfactory degree of reliable comparative analysis from item to item and from evaluation to evaluation.

The rating scale appears on the PEC instructions which explain that 0 indicates the item does not describe the course, and 9 means it very definitely does. For each item, the participant is instructed to fill in the number that represents his response. The responses are then run through the computer to obtain mean responses for each item. These means are further grouped into "subscores" for each of the program aspects. In this way, program strengths and weaknesses are easily pinpointed for an individual course, and the data provides a base for statistical comparison from course to course, from year to year.

This method of evaluation can provide relatively reliable feedback in a very short period of time, usually prior to course completion.

Evaluation Results

Evaluation results can be obtained in two forms, as computer printout or as evaluation highlights, which are prepared from the computer data. In the highlights, the results are written up for each subscore (or program aspect) and for overall evaluation results. For example:

Overall Evaluation

The participants were asked in item #28 to evaluate the course as a complete unit. The mean score was 7.01 with a standard deviation of 2.98.

And as it appeared on the computer printout:

```
ITEM  LOW   2     3     4     5     6     7     8

28    0.03  0.10  0.04  0.06  0.10  0.04  0.06  0.12

HIGH  OMIT  MEAN  S.D.

0.30  0.01  7.01  2.98
```

The printout breaks the data down into the percents of responses for each number of the rating scale. With this breakdown, it is easy to see what percent of the class rated a particular item very low or very high. This allows some expanded insight into the mean score. For instance, though the mean score is 7.01, which is not exorbitantly high, 30% of the participants gave the item the highest possible rating of 9. This sort of information can be obtained from the printout, but is also represented statistically in the Evaluation Highlights by the Standard of Deviation.

For the demographic information, both the highlights and the printout give the percent of participants falling into each category as it appeared on the evaluation.

For Example:

AGE: 23% are age 20-25, 41% are age 26-35, 23% are age 36-45, 13% are 46+

The increments for ages are fairly standard, but for other demographic variables, categories will be specified by the program coordinator. Obviously, a course in bookkeeping has a different clientele than a course in nursing, so for the variable "Occupation," selections would change.

Validity of the Evaluation Questions

One important characteristic of a good evaluation instrument is its validity. Does it measure what it is supposed to measure? Normally an instructor developing evaluation items decides whether or not his questions bear relationship to the presented material, particularly to the outcome of the program. These judgements by a single individual are subject to a large margin of error.

To be certain of validity and to improve the quality of the evaluation instrument, each item in the Program Evaluation Checklist bank was judged by a number of qualified individuals. All the items have been evaluated by students and faculty members. The evaluation items were rechecked for any ambiguity or irrelevant phrase by a professional editor who also estimated the reading level of the items.

Reliability

Reliability refers to the consistency of a test or, in this case, of the evaluation instrument. For example, if the evaluation is split into two halves, the students' scores on the first half should be similar to the scores on the second half. Reliability may vary from 0.00 to 1.00, but a good evaluation instrument should have a reliability coefficient of at least 0.80, preferably 0.90.

A MERMAC computer program is used to measure the reliability of each section of the evaluation instruments. The program not only determines the reliability of each cluster of items such as technical, lecturer, content etc., but also gives information for evaluation improvements such as quality of items, item difficulty and predictive power of an item.

The Spearman-Brown split halves technique is the basis for the computer program.

Using Evaluation Results

Since each of the subscores (program material, program lecturer, organization, physical facilities, technical operations and content) represent a judgement by different criteria, we are able to use the subscores to determine the strengths and weaknesses of the course.

The various subscores are interrelated, which must be considered when analyzing evaluation results: poor technical operations will condition the responses to other aspects; a very good lecturer can sway judgements of course material; etc.

Instrument Reliability

The evaluation data also provides an overall rating of all items taken together. The effectiveness and reliability of the evaluation can be double checked by comparing the overall rating with the rating the participants gave to the item which asks for their overall feelings toward the program. These should be reasonable reflections of each other.

The Content Subscore is one that might be given some special consideration by the program coordinators. Most of the items on the PEC are standard within a certain range, but the content items are prepared primarily by the program coordinator. These items are related to course outcome, how well the material relates to what the students want and need to learn. At least five content items are created specifically for every course evaluated. The content items take the individual course objectives and frame them into affirmative outcome statements. For example, from a Real Estate Course: "I now have an understanding of listing contracts and contracts of sale"; from a course for English Language teachers, "I now am aware of a new approach to spelling."

In an analysis of the content items from the evaluation, a program coordinator or lecturer should be able to judge how effectively the course design and content fulfills the needs of the participants and how well the course met with its objectives.

General Comments

The comments returned by the participants with the evaluation are considered carefully with the data. Generally, the comments can be supplied in an aggregated, typewritten form. This is an important avenue of communication between instructor and participant, and should not be overlooked. Frequently, answers to particularly low evaluation scores can be found in the comments.

Summary

The purpose of evaluating teleconferencing programs is to help programming faculty determine the strengths and weaknesses of programs transmitted via the systems, so that improvements can be made in future programs.

In order to accomplish this task, a search was carried out for the appropriate method of studying the profile of the adult participant and measuring the components of educational communication. The search resulted in the selection and development of a rating-scale method of evaluation. This type of evaluation is most suitable because it represents a systematic procedure for measurement.

The data derived from the Program Evaluation Checklist is amenable to statistical analysis. It is also a research tool which may be repeatedly employed to test teaching techniques in the field of educational communications.

Administration of Wisconsin Teleconferencing Systems

Evaluation is only one of many tasks which must be performed to run these networks, and, as ETN and SEEN grew, they required an administrative unit to be responsible for their operations and educational program development. Instructional Communications Systems oversees these two systems and the Subsidiary Communications Authorization (SCA). In addition, ICS coordinates the use of Dial Access for Extension.

Instructional Services

In order to develop the most effective educational experience possible via the teleconferencing systems, ICS provides program coordinators to help plan programs on the systems. The services which ICS provides encompass the entire program:

1. program design--identifying a program audience and its objectives; formulating a budget for the program
2. program production--prerecordings, coordination of lectures from other sites and originating stations, tape duplication, tape packaging, etc.
3. program promotion
4. program registration
5. program evaluation
6. program packaging for independent and small group study
7. communication system development

Personnel for Instructional Communications Systems includes 11 fulltime staff members, student operators and part-time clerical assistants. Brief descriptions of the duties of ICS personnel are given below and supplemented by a chart which illustrates the administrative flow.

Director of Instructional Communications Systems

It is the responsibility of the Director of Instructional Communications to develop policies and programs offered on the ICS Systems. The Director works cooperatively with other members of the Educational Communications Division and Extension faculty and administration team. Since many phases of ICS programs have direct bearing on the instruction programs, there is a close working relationship between the Director and faculty, administration and students in the implementation of programs.

Assistant Director

The Assistant Director is responsible for internal administration of the department with emphasis on program production, program development and instructional design. This includes the management of the day-to-day operation which involves technicians, program coordination, traffic and clerical support for staff.

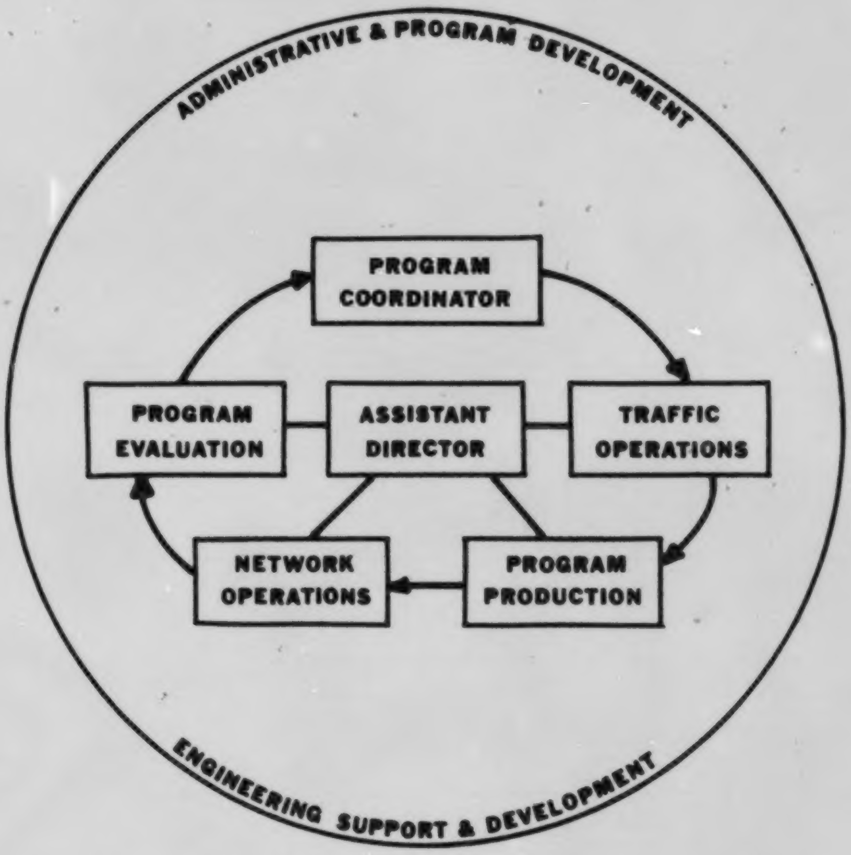
Technical Director

The major function of the Technical Director is to coordinate and supervise the development of all operations of ICS. If the communications systems are to be constantly improved, new technical developments must be explored and implemented to meet the needs of imaginative programming faculty.

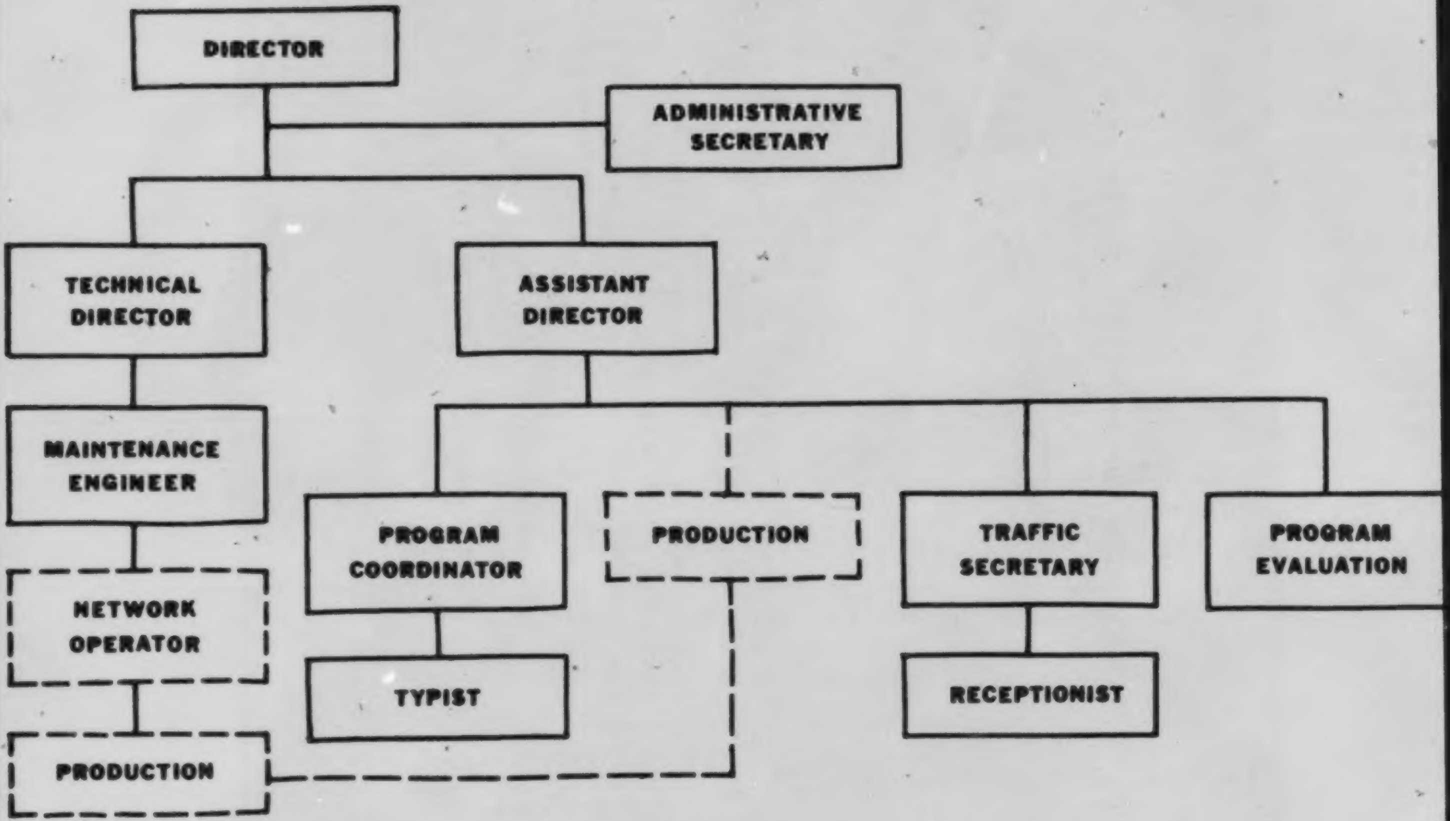
Operation Engineers

The successful completion of programs is directly related to the quality and operation of our network control room. The network control engineers are called upon to operate professional audio tape machines, cartridge machines, broadcast type consoles, complex audio distribution matrix, electrowriters and

INSTRUCTIONAL COMMUNICATIONS SYSTEMS (ICS)
PROGRAM OPERATION FLOW CHART


ADMINISTRATIVE & PROGRAM DEVELOPMENT
PROGRAM COORDINATOR
PROGRAM EVALUATION
ASSISTANT DIRECTOR
TRAFFIC OPERATIONS
NETWORK OPERATIONS
PROGRAM PRODUCTION
ENGINEERING SUPPORT & DEVELOPMENT

FLOW CHART


DIRECTOR
ADMINISTRATIVE SECRETARY
TECHNICAL DIRECTOR
ASSISTANT DIRECTOR
MAINTENANCE ENGINEER
PROGRAM COORDINATOR
PRODUCTION
TRAFFIC SECRETARY
PROGRAM EVALUATION
NETWORK OPERATOR
TYPIST
RECEPTIONIST
PRODUCTION

other sophisticated electronic equipment. These engineers are responsible not only for the program signal leaving the control room, but also for the reception and return signal. ICS operation engineers are required to have a Federal Communications Commission Radio and Telephone operator license as we have found it beneficial for the engineers to have a grounding in theory of electronics operation.

Program Coordinator

The Program Coordinator is responsible for the implementation of all the operational procedures that have been designated by faculty committees. This includes scheduling of programs, meeting with all Extension department programmers, providing assistance to the programming departments on design and promotion of materials, scheduling all listening locations for specific programs and serving as the liaison for the registration and program information office. Another critical function of this position is the training of Local Program Administrators and ETN aides that are hired on an annual basis to assist the program implementation at each of the ETN/SEEN locations.

ETN Station Equipment: Technical Data

While the Technical Director is specifically concerned with the development and operation of equipment, the entire ICS department is based on the assumption of a well working technical system. To be an effective instructional communications system, ETN must provide a means of instantaneous interaction among students and their instructor. The system of station equipment which serves ETN and insures this capability consists of the Darome Edu-Com II, installed at locations throughout the state and interconnected by a complex network of telephone lines. Approximately 5000 miles of wires and the facilities of 20 telephone companies are employed to provide this statewide system.

ETN must carry educational programs across the state without interfering with the ongoing teaching and learning process, and with proper educational design and technical operation, ETN can meet this demand. Every effort was made during the design and construction of the station equipment and transmission system to provide easy operation and reliable, trouble-free service.

ETN Station Equipment

The Edu-Com is a self-contained communications unit, with four microphones, which plugs into a standard telephone coupler. Via this unit, anyone at a participating ETN location can be heard at any of the other linked locations simply by pressing the lever on the Edu-Com microphone and speaking into it. Below is a summary of the Edu-Com's general, physical and operational features.

General:

A. Three built-in speakers provide good audience coverage.

B. The Edu-Com is equipped with four microphones, each of which has a push-to-activate bar. Everyone in the room can hear each speaker's questions and answers.

C. The Edu-Com II signal cord (20 feet) plugs into a sturdy 4 prong jack.

Physical:

A. The unit is self-contained: all four microphones and associated cords store inside the cabinet.

B. It is portable: each unit weighs only 20 pounds complete and has a convenient carrying handle.

C. The unit measures approximately 20 inches wide, 12 inches high and 9 inches deep.

D. All cord connections and microphone storage have been designed for easy set up and take down.

E. All associated electronics are solid state and contained within the cabinet.

F. The Edu-Com II cabinet has an attractive wood grain vinyl type finish and has clean lines for storage.

G. The microphones are rugged plastic and are self-standing.

Operational:

A. The unit is easy to operate. Once set up, the listener needs only to adjust the speaker volume control for comfortable listening level and depress the push-to-activate bar when he wishes to ask a question or respond on the network.

B. Speaker volume control is located on the side for easy access.

C. The Edu-Com II is AC powered with a pilot light to tell you when the unit is plugged in.

D. The four microphones are provided with cords 20 feet long to reach into the audience. Also, there are 20 feet of signal line cord, a feature which allows set-ups to be versatile.

E. There are easy-to-perform test procedures built into the unit which let users know whether the equipment is operating when it is set up and plugged in. If there is a malfunction, the entire unit is replaced.

Operation of ETN Station Equipment

During operation of the Edu-Com II, an incoming signal is amplified by internal electronics and three built-in speakers. This speaker-amplifier combination is capable of covering up to 200 people. The signal from the microphone is processed by additional electronics and sent out on the line to the local central office where the signal reverses its path back to Madison and all other ETN sites on the network.

Public Address Feature. Another aspect of this unit is a public address feature, which, built into the Edu-Com II, provides a psychological feedback mechanism to assist students in proper operation of the microphone. For best results, a student should speak in a normal voice, 4 to 6 inches away from the microphone. If the user speaks too loudly or moves in too close, an annoying, distorted sound is produced which forces him away. If the student gets back too far, people will not be able to hear him over the network, and he will automatically move forward until he reaches the optimum distance. At that point, he can hear his voice coming out over the speakers.

The incoming signal level for this system is standardized for all stations and guaranteed by the telephone company. The public address level is a function of this incoming signal level, which rides above the level of the PA feature throughout the range of the level control. If a malfunction occurs, and a low signal level is produced at one of the ETN locations, the natural reaction of the user is to turn up the program level control in order to hear. In doing this, he finds that, the first time he attempts to speak over the set, it will howl, squeal and disrupt the program.

If this happens, the "public address feature" switch located on the back panel should be moved from normal to defeat. Moving this switch to the defeat position eliminates the public address feature thereby doing away with the interfering noise and enabling the program to continue. At the end of the program, the switch is returned to normal, and the low signal condition reported either over the network to the operator at the Madison center or by calling a toll free number for the telephone company toll center in Madison which is responsible for solving malfunctions on the ETN.

Transmission System. Before reporting further on the operation of this equipment, it is advisable to explain briefly how the signals get from location to location and how the Edu-Com electronics work. (Refer to the sketch.)

The signal originating from the ICS studios in Radio Hall is carried by wires to the Wisconsin Telephone Company's private line central office and test board located in Madison. From there it is distributed to regional telephone company long distance central offices located in various places in the state: Madison, Milwaukee, Racine, Appleton, Stevens Point, Eau Claire and Rice Lake. From these offices, it is further distributed to local conference bridge locations and from there relayed to various local central offices. Each station is connected to the local central office by wires which allow the signal to appear at jacks located in designated rooms at ETN sites.

Maintenance of ETN System

Trouble free service from a communications system this vast and complex doesn't just happen. It takes active participation by all involved, whether on the local level, with the telephone company, or at the Instructional Communications Systems studios in Madison. Those charged with the task of setting up, operating , and troubleshooting the various parts of the system, must become completely familiar with all its aspects. Participating telephone companies are responsible for the operation and maintenance of the interconnect system, while Local Program Administrators are obliged to see that the Edu-Com II station equipment is properly set up and used. To do this and to recognize when trouble occurs, they must become completely familiar with its operation.

Trouble Reporting System. The Edu-Com equipment was designed using the latest solid state technology to be as reliable as possible. Of course, anything of a technological nature can break down. For this reason, and because this unit is not handled by them, local telephone companies will not replace or repair the unit if it breaks. In many cases, they won't even acknowledge that it exists. To them it is considered customer owned and maintained equipment. If trouble with the unit occurs, the LPA notifies the ICS office in Madison where personnel see that it is replaced within 24 hours. Anticipating the time lag, the expense, and the effort needed to replace a unit, it was deemed important during the design phase of the Edu-Com II to build in test procedures to verify that a genuine problem with the unit exists. If the test procedures are performed and the unit does pass, it indicates that the unit is operating and that the trouble lies in the telephone company lines and interconnect devices throughout the state. Ninety-nine percent of the time the trouble is with the transmission system, so it is important that all LPA's become familiar with these testing procedures.

Loopback Test. The Edu-Com II is equipped with a voice switching feature. This device allows users to talk over an open microphone and hear others over a speaker at virtually the same time without squeal or feedback. If this mechanism breaks down, it will disrupt the operation of the unit and the network. It is the responsibility of the LPA to test this feature. On the back panel of the Edu-Com II is a slide switch marked loopback program and test. This switch ties the output signal from the microphone, which normally goes to the network, back into the receive side of the equipment. Actually, the entire set of electronics in the unit is being tested, right down to the signal line cord. This could be broken, cut or not plugged in, but that situation can be easily verified. To perform the loopback test, the LPA sets the program level control to about 6, removes the signal line cord from the ETN jack, takes a microphone and operates the loopback switch to the test position. This switch is spring loaded and, if it sticks in the test position, the unit will malfunction and disrupt the network. The tester then pushes the activate bar, speaks into the microphone and listens for two things: 1) his voice coming through the speaker broken up and distorted, and 2) a pumping action to the sound. As he speaks, a feedback ringing will disappear; when he stops, it reappears. If these two conditions are met, the equipment has passed the loopback test and is operating properly. This enables the LPA to tell the telephone company via the toll free call or the operator in Madison that "my equipment is OK. The trouble must be with the telephone lines."

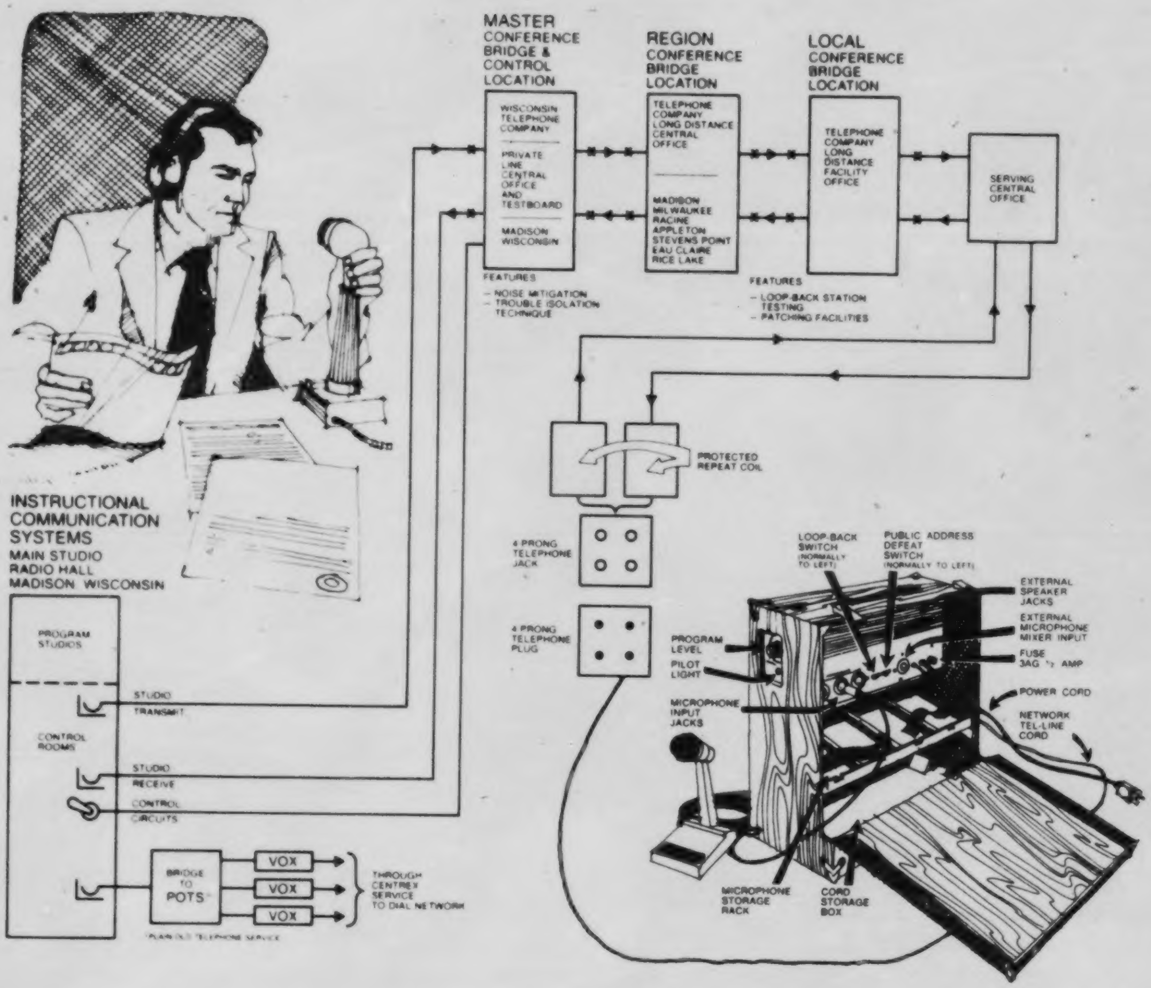
Additional Plug-In Modular Equipment

When it is needed, the auxiliary mic preamp jack allows the extension of another four microphone capability to the unit. In addition, there are two jacks for external speakers. For those locations that have a very large lecture hall, a column speaker can be provided to give depth and additional coverage not available with the built in speakers.

Additional microphones are also added when a large group is participating at one location. The mics simply plug into the base station equipment.

Advantages of ETN-SEEN Systems

Response to the Educational Telephone Network and Statewide Extension Network in Wisconsin has been varied but generally favorable. Our clients like the networks, originally because of the novelty, but as evidenced by their continued participation, probably because of the convenient access to teaching


MASTER
CONFERENCE
BRIDGE &
CONTROL
LOCATION
WISCONSIN
TELEPHONE
COMPANY
PRIVATE
LINE
CENTRAL
OFFICE
AND
TESTBOARD
MADISON
WISCONSIN
FEATURES
– NOISE MITIGATION
– TROUBLE ISOLATION
TECHNIQUE
REGION
CONFERENCE
BRIDGE
LOCATION
TELEPHONE
COMPANY
LONG DISTANCE
CENTRAL
OFFICE
MADISON
MILWAUKEE
RACINE
APPLETON
STEVENS POINT
EAU CLAIRE
RICE LAKE
LOCAL
CONFERENCE
BRIDGE
LOCATION
TELEPHONE
COMPANY
LONG
DISTANCE
FACILITY
OFFICE
FEATURES
– LOOP-BACK STATION
TESTING
– PATCHING FACILITIES
SERVING
CENTRAL
OFFICE
PROTECTED
REPEAT COIL
4 PRONG
TELEPHONE
JACK
4 PRONG
TELEPHONE
PLUG
INSTRUCTIONAL
COMMUNICATION
SYSTEMS
MAIN STUDIO
RADIO HALL
MADISON WISCONSIN
PROGRAM
STUDIOS
STUDIO
TRANSMIT
CONTROL
ROOMS
STUDIO
RECEIVE
CONTROL
CIRCUITS
BRIDGE
TO
POTS*
VOX
VOX
VOX
THROUGH
CENTREX
SERVICE
TO DIAL NETWORK
*PLAIN OLD TELEPHONE SERVICE
LOOP-BACK
SWITCH
(NORMALLY
TO LEFT)
PUBLIC ADDRESS
DEFEAT
SWITCH
(NORMALLY TO LEFT)
EXTERNAL
SPEAKER
JACKS
EXTERNAL
MICROPHONE
MIXER INPUT
FUSE
3AG ½ AMP
POWER CORD
NETWORK
TEL-LINE
CORD
PROGRAM
LEVEL
PILOT
LIGHT
MICROPHONE
INPUT
JACKS
MICROPHONE
STORAGE
RACK
CORD
STORAGE
BOX

resources. The real significance of the ETN-SEEN systems is not the statistical analysis, but rather in its special capabilities:

- It provides for truly "continuing" education, enabling participants to receive limited amounts of information frequently. This allows students to assimilate the new information into their daily activities. With some of the more traditional forms of continuing education, where they receive massive doses of information once or twice a year, there is doubt that much of it is effective.
- There is great economy in time and money for the participants and the faculty. Neither is required to travel significant distances or spend large amounts of time away from occupational or teaching responsibilities.
- Departments are able to reach entirely new audiences which had been neglected previously. For example, each month a program is offered to 400-500 housekeeping personnel and 300-400 food service workers in 70 hospitals. Prior to this there were no continuing education programs offered to these personnel in Wisconsin and, if there had been, it is doubtful whether hospitals would have released them from their responsibilities and paid their expenses to travel to traditional courses.
- ETN-SEEN enables us to reach isolated professionals who would otherwise be in an educational vacuum. Professionals have indicated they would not have settled in small Wisconsin communities if it had not been for the availability of continuing education provided by ETN-SEEN.
- The public relations aspects of the media are significant. The programs presented via the ETN-SEEN systems offer tangible evidence that the University is vitally concerned with the day-to-day problems of professionals and consumers, as opposed to the more esoteric research which may eventually filter down to the local level.

With the proper planning and a little imagination teleconferencing systems can meet many educational needs. What are yours?

The next sections of the Wisconsin teleconferencing story are told in papers including:

1. operational procedures,
2. teaching techniques, and
3. technical systems.

Footnotes

[1] "The Telephone Will It Succeed? An 1880 Report," The Videocassette and CATV Newsletter, July, 1975, pp. 10-11.

[2] This conference took place in 1967, the ETN system consisted of 48 locations, necessitating travel for some faculty as they did not have a location in their office facilities.

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OPERATIONAL ASPECTS FOR PROGRAM PLANNING

Millie Seaman
Program Coordinator
Instructional Communications Systems
University of Wisconsin-Extension

In 1968, a report of the ETN/SCA Extension Advisory Committee was mailed to the University of Wisconsin-Extension specialists outlining the procedures and guidelines for using a new media called the Educational Telephone Network. At that time, three years after its birth, ETN linked 56 courthouses, 48 hospitals and 11 UW Campuses, and was being used extensively by the School of Medicine and the School of Nursing. This system was also employed by the Extension Division of Community Programs for its weekly statewide staff conferences. The Advisory Committee's report encouraged further use of this new media by Extension faculty as an alternative to traditional face-to-face meetings in order to reduce travel and still reach widely scattered audiences.

This encouragement resulted in a surge of ETN programming during the next year. Scheduling and promotion of ETN programs by Extension faculty caused considerable concern in the County Extension Offices, placing heavy demands on the county faculty and their facilities. To meet these demands, the ETN Advisory Committee (the Anderson 1 Committee) came up with recommendations which are the basis of ETN procedures used today. Before examining how these guidelines currently function, it seems beneficial to take a brief look at the history of their development.

When it became apparent that planning and coordinating the programs to be presented on the Educational Telephone Network was a complex task, the ETN Advisory Committee made the following suggestions:

1. Appointment of the County Extension Office Chairman as Local Program Administrator (LPA) at a location, with operation of facilities coordinated with the District Director.
2. Use of a centralized registration system.
3. Responsibility for promotional materials with the programming unit.
4. Instructional approval of programs transmitted.
5. Submission of program listing 60 days prior to semester instruction.
6. Adoption of subcommittee ETN handbook incorporating committee recommendations.

In 1971 an ETN Advisory Committee (the Anderson 2 Committee) was appointed by the Dean of Extension for the purpose of exploring and reexamining previous guidelines established for network operations. This committee came up with the following major recommendations:

1. Coordination of network programs by a faculty person in each county, appointed by the District Director on a yearly basis, and put into writing.
2. Use of ETN limited to Extension-sponsored programs.
3. Locations under the jurisdiction of Extension faculty for security reasons.
4. Scheduling procedure to be on annual basis.
5. Meeting with programmers for program planning on a semester basis.
6. Enforcement of criteria and guidelines with programmers.

It should be pointed out that the Advisory Committees incorporated a broad-based faculty representation from all Extension divisions who were associated with ETN programming. Through the ideas and recommendations of these committees over the ensuing year, the policies and procedures for implementing programs on the network took shape.

The procedures and guidelines are outlined here as they have evolved through the committee recommendations, and as they are used today by Extension programmers in implementing their programs. These procedures apply specifically to general types of programs, that is, non-credit and credit programs involving registration. Steps followed to implement medical programs at hospital locations, and public service programs, such as agent training, committee meetings and conferences without registration, are modified to accommodate those types of programs. Therefore, with the large variety of programs, procedures do not follow a rigid pattern; they are tailored to particular needs. Let us now consider the specific steps taken in setting up a program for ETN.

The Planning Process

Scheduling

It all begins each January at the annual scheduling meeting. Prior to the meeting, a letter is mailed to Extension programmers and users inviting them to attend and requesting information about their program needs on the network for the upcoming academic year. Their program requests for network time are then submitted to Instructional Communications Systems (ICS), one to two weeks before the meeting date. These are sorted out, using established guidelines, and pre-plotted on master schedules before the actual meeting. Adjustments are made in the requests when preplotting in order to best utilize the network hours, and to resolve conflicts before the meeting. Adjustments are not made arbitrarily, but are checked out with the programmer by telephone. It is at the actual meeting, however, that the programmers have the opportunity to see how their programs fit in relation to others, to negotiate time, if needed, and to firm up their schedules. Departments that cannot work out scheduling difficulties are referred to an Advisory Committee to resolve them. (This has not become a necessity as yet.) Within a couple of weeks after the meeting, all requested network time is double checked and confirmations mailed to the network programmers.

Although requests for network time can be made during the year, after the annual scheduling meeting, by then, prime time (4:30-10 p.m.) is no longer available unless there has been a cancellation. Unscheduled network time is most often used later by Extension faculty for committee meetings or by Extension agents for discussion of current topics and issues.

Departments that do not use the times reserved, and that do not give 90 days notice are assessed $100 per hour for unused time. With 90 days notice, another department has ample time to plan a program.

The networks are operational September through May from 7 a.m. to 10 p.m., Mondays through Fridays, and from 8 a.m. to 12 noon on Saturdays. Based on figures from the last annual meeting, the network is used approximately 55% of the time. Unused network time appears mostly to be mornings from 7 to 8:30, scattered afternoon slots, Friday evenings, and Saturdays. Basically, all prime time is now being scheduled, and there are more requests than there is time available. Programs vary in length ranging from one-half to three hours, but most run one to one and one-half hours. The number of program sessions also varies considerably, the most common being the weekly or bi-weekly general type of program. However, the range includes the daily Community Programs Message Service for statewide Extension faculty and the monthly Continuing Medical Education Programs which run the full year. These various types of programs are covered in other papers.

Meeting with Programmers

Once the programs have been scheduled, the next step in the planning process is for the programmers to meet with the Instructional Communications Systems faculty. This meeting is usually arranged by the ICS Office approximately three months before the first program date, in order to discuss the program objectives, exchange ideas and to give assistance with the overall planning of the program. About four years ago a slide presentation on program planning procedures was introduced and used at each meeting. During the last year, this presentation was developed into a 20-minute video tape entitled "Helping ICS to Help You." We have found the video tape an invaluable aid to programmers because it illustrates the many elements involved in the planning process, including the web of Extension support activity so essential in planning a successful program. In addition, a brochure on planning procedures has been written as a guide for programmers. (Exhibit 1)

When meeting with department programmers, the ICS staff makes these assumptions:

1. that the program meets the criteria established for use of the network;
2. that the programmer is responsible for determining the need and content of the program;
3. that we do not attempt to make any program judgements;
4. that we provide assistance in the areas of program format, media presentation and technical know-how.

Basically, the meeting sets out to establish an operational plan with deadlines and considerations, such as:

- IDENTIFYING THE TARGET CLIENTELE: justification of how and why ETN meets program and clientele needs
- ESTABLISHING A BUDGET: Program materials, mailings, production, support staff, honorariums for speakers, people needed to make the program successful and arriving at a program fee
- PLANNING PROMOTION AND PUBLICITY: Brochures, when and to whom, assistance from Program Information with press releases, radio spots, feature stories, radio-TV appearances.
- PLANNING A PRODUCTION TIMETABLE: Pre-recordings, telephone tie-ins, remote program originations, A-V materials, cassette packaging
- OBTAINING INSTRUCTIONAL APPROVAL: Department Chairman and Divisional Dean
- REGISTRATION PROCESS INVOLVED
- EVALUATION INSTRUMENT TO BE USED
- PROGRAM MATERIALS: Handouts, books required, estimated and ordered
- COURSE DESIGN TO BE FOLLOWED
- STATION SELECTION: Statewide or selected locations

Program Initiation

The decisions reached in the operational planning meeting are confirmed by the ICS Program Coordinator in the form of a Program Initiation Request, (Exhibit 2) which serves as the official contract between the sponsoring department and ICS. Formalizing these commitments alerts the people involved in the planning, production and registration areas. Programmers who have used the network before and who plan to offer the same program, need not necessarily meet each semester. A standard information sheet has been devised for programmers to complete and return which establishes the operational plan. A follow-up phone call usually is all that is required to confirm program commitments. We place particular emphasis on personal contact and a good working relationship with the programmer, not only in the initial planning phase, but throughout the duration of the program.

UWEX
UNIVERSITY OF WISCONSIN-EXTENSION

etn educational telephone network
sca subsidiary communications authorization
seen statewide extension education network

planning procedures for etn·sca·seen programs

1. Reserve Time on the ETN/SCA/SEEN Systems
   (Use limited to Extension-sponsored programs)
   a. Attend annual department scheduling meeting to reserve time 9 months in advance.
   b. Programs with registration should be scheduled 90 days in advance. Contact the Instructional Communications Systems (ICS) office at 262-4342.
   c. Public service programs should be scheduled at least 30 days in advance.

2. Obtain Instructional Approval
   -Approval by department chairman and divisional dean is required for services necessary during the presentation of the network program.

3. Design program with Instructional Communications Systems staff
   a. Schedule a program design meeting with ICS staff 90 days prior to the first program. This meeting will assist in the overall design of the program.
   b. Have instructional approval number prior to program design meeting.
   c. Design meeting will include:
      -Stating the objectives
      -Identifying the audience
      -Planning a production timetable
      -Establishing a media presentation
      -Formulating a budget for the program
      -Establishing a registration procedure
      -Planning publicity
      -Evaluating the program

4. A Program Initiation Form is completed by ICS after the design meeting. This is an agreement of program arrangements with the program department and ICS. Copies of the agreement are distributed to the department coordinator, the ICS production coordinator, the systems engineer, and Student Services.

PUBLICITY & PROMOTION

Program Announcement
-Prepared by ICS program coordinator in conjunction with the program department — establishes formats for publicity and registration.
-Sent directly to all LPAs 60-90 days in advance of the program.
-Includes pertinent information on program, such as: title, dates, time, department coordinator, clientele, course description and materials, publicity, registration and station selection.
-Refusal postcard enclosed for LPAs to return within 2 weeks if network facilities will not be available.
-ICS program coordinator sends listing of confirmed network locations to program department and Student Services. With this, the program department's brochure can be finalized.

Brochures
-Prepared by program department
(Allow 6 weeks to reproduce)
-Includes program information, registration form and address panel.
-Contact publications editor for assistance in layout, editing and direct mail (Ray Duerst, 2-8940).
-Proof of brochures must be checked by ICS or publications editor.
-Mail brochures 1 month before initial program to:
   a. clientele groups
   b. LPAs (10-15 copies with letter informing them which clientele groups were reached)
   c. ICS Office (10 copies)

News Releases
-Prepared by Extension Public Information Office and sent to the county offices 1 month before the first program, allowing counties time to localize and send to news media.

Community Programs Broadcasts
-Departments have the opportunity to talk about upcoming programs on the weekly Monday a.m. faculty conference broadcasts. Call the C.P. Office at 263-2733 to schedule presentations.

Radio & TV Spots
-County offices should send news releases to radio and TV stations in their area.
-Appearances on radio and TV interview programs can be arranged through the ICS Office.

Releases for Organization Bulletins
-Contact the Extension Public Information Office for assistance in writing bulletin releases.

Fliers
-Inexpensive handouts, prepared by ICS or counties, contain listings of upcoming ETN/SCA/SEEN courses each semester.

Posters
-Departments could use posters wherever distribution of fliers and brochures takes place and also for TV presentations.

EXHIBIT 1

PROGRAM INITIATION REQUEST (PIR)
ETN-SCA-SEEN

UWEX

Department No ____________________ Date ____________________

Instructional Approval No ____________________

MEDIUM	STATION LOCATIONS		ORIGINATION POINT
____ ETN	____ Hospitals	____ County/Campus Statewide	____________________
____ SCA	____ Libraries	____ Selected ____________	____________________
____ SEEN			____________________

PROGRAM ____

DATE(S) ____

TIME(S) ____

CLIENTELE ____

COORDINATOR ____________________ MODERATOR or INSTRUCTOR ____________________

ADDRESS ____________________ ADDRESS ____________________

TELEPHONE ____________________ TELEPHONE ____________________

REGISTRATION

FEE: $ ____________ ____ Public Service

Pre-Registration ☐ Yes ☐ No

Registration Deadline ____________________

____ Conveners

SUMMARY OF REGISTRANTS OR NO. OF PARTICIPANTS ____________________

TOTAL INCOME ____________________

PUBLICITY

- ☐ Brochure or Flier ____________________
- ☐ Press Release ____________________
- ☐ Feature Story ____________________
- ☐ Community Programs Newsletter or Morning Broadcast ____________________
- ☐ Radio-TV Spots ____________________
- ☐ Program Announcement Locations Established ____________________
- ☐ Other ____________________

PRODUCTION REQUIREMENTS

- ☐ Studio
- ☐ Remote
- ☐ DDD (Phone No. ____________________)
- ☐ Tape Inserts
- ☐ Tape Duplication
- ☐ Visuals
- ☐ A-V Equip. @ locations
- ☐ Course Materials

GENERAL PROGRAM DESCRIPTION

EVALUATION

COMMENTS

White–Program Coordinator / Goldenrod–Scheduling / Yellow–Programming Dept. / Blue–Registration / Green–Production

EXHIBIT 2

Program Announcement

Preparation of a Program Announcement is another activity generated by the operational planning meeting. The Program Announcement is prepared by the ICS Program Coordinator in conjunction with the department programmer to provide the Local Program Administrator (LPA) and network coordinators with pertinent information on the program. A schedule card is enclosed which must be returned within a given time, usually two weeks, if the network facilities cannot be scheduled. (Exhibits 3 and 4) When there are two locations in a city, for example, at a courthouse and on a UW campus, usually only one location is scheduled. It is the administrative responsibility of the LPA to determine location availability, and to use the schedule card to inform us at ICS accordingly. From the schedule cards returned, a listing of confirmed locations is sent to the sponsoring program department and the Registration Office which keeps a checklist for location requests. The program department then finalizes its program brochure identifying specific network locations. The Program Announcement, with its approximate 60-day lead time, gives the LPA's and the programmer ample time to properly schedule and promote the programs.

Promotion and Publicity

Newspaper Tabloid

Although the Program Announcement serves as the basis for promotion and publicity, the first piece of publicity on network offerings is in the form of a newspaper tabloid. (Exhibit 5) This contains a total listing of programs by department and includes dates, time, fee, clientele, and a general description of the course. In addition, there is a feature story describing the ETN system and photographs showing the equipment in use. Prepared by ICS, with assistance from the Program Information Office, the tabloid has proved to be an economical and convenient way of giving interested persons an overall view of upcoming programs on a semester basis. Last year a total of 60,000 copies were printed and mailed to the Local Program Administrators for distribution at county fairs, meetings, conferences, information booths and by general mailings to individuals requesting information on network programs. In one of the counties, the continuing education agent bulk mailed the tabloid to all names on their adult education list and had it distributed through the schools to teachers.

Brochures

The single most important tool for publicity is the brochure or individual flier on each program. Preparation of these is the responsibility of the programming department. Extension's Program Information Office assists the programmer in the design and editing of brochures, and has developed a standard format to prevent information from being omitted. (Exhibit 6)

Brochures include all pertinent facts needed to register for the class plus such information as purpose, method and structure of that particular program, and a brief description of ETN. One panel of the brochure always contains a confirmed list of ETN locations. This standardized list gives towns and cities alphabetically with specific locations noted for each city with more than one ETN center. Available locations are checkmarked, and those without a check are not available for that particular program. The LPA's telephone number is included next to the city listing in case the student wants further information. Such a standardized list is advisable to prevent constant retyping of the ETN locations list, as was the case before this panel was designed.

Considering all time factors, we recommend brochure copy be prepared at least two to three months in advance. Brochures are designed as self-mailers and are sent out by the departments using established mailing lists, about four weeks in advance of the program. Cover letters are mailed with copies of the brochure to the LPA's describing the clientele reached through their mailings, and assistance is requested in the distribution and promotion of the program at the county level. According to program evaluations, direct mail efforts scored highest as a means of informing participants of network programs.

Press Releases

The Program Information Office assists the programmers in writing all program news releases. One general round-up release is prepared at the beginning of each semester for programs offered that semester and sent to the LPA's who are asked to fill in blanks, have the story retyped and mailed to all the newspapers in the county. This initial story is followed up with shorter releases of similar formats on individual classes or groupings of programs which involve the same clientele, such as three courses for teachers. Releases in which LPA's have inserted their county names and network locations give a local touch which results in far greater usage than if the stories were mailed direclty to the newspapers. In addition the LPA's usually know the editors and columnists of their community papers, and will localize the releases readily. (Exhibits 7 and 8)

Radio Spots

Radio spots are prepared by the Program Information Office on programs with general appeal, such as "Law for the Public" which is aimed toward a broad group of people, impossible to reach except through the media. Radio spots also might be prepared on education courses since the Education Department cannot afford to send direct mail pieces to all the teachers in the state or to al' interested parents.

Feature Stories

Another means of promoting programs is through feature stories. Last year the Program Information Office wrote one such story about a woman who took an ETN "Article Writing" course and how one of the stories she wrote for the class was bought by Reader's Digest. Stories are also written about new network locations and special programs, like the "Piano Teacher's Forum" which introduced music to the ETN system.

Newspaper Advertising

Three years ago funds were given to Program Information to conduct an experimental project of advertising for ETN programs. Ads were placed in all the newspapers in three counties, and a check was run to see if ETN enrollments increased at a greater rate in those counties than in other counties around the state. The experiment seemed to bear this out, however, the cost for 29 ads was over $1,000, and funds just were not available to place the ads statewide.

UWEX
UNIVERSITY OF WISCONSIN–EXTENSION
Instructional Communications Systems

ETN-SCA #70
PROGRAM ANNOUNCEMENT

Old Radio Hall, 975 Observatory Drive, Madison, Wisconsin 53706 (608) 262-4342

TO: Local Program Administrators
FROM: Millie Seaman, Program Coordinator
DATE: November 5, 1974

PROGRAM TITLE: POLITICAL ADVERTISING & PUBLIC RELATIONS

DATES: 1975 January 23, 30
February 6, 13

TIME: 8:00 - 10 p.m. (THURSDAYS)

DEPARTMENT: Communication, UWEX

COORDINATOR: Therese R. Binder
Communication, UWEX
222 Lowell Hall
Madison, WI 53706

PHONE: 262-3982

CLIENTELE: Ad Club Members; PRSA Wis. Cahpters; Lobbyists; State & Local Legislators, League of Women Voters; Leadership in Rep. & Dem. Parties; Wis. Broadcasters Assn. members; Pages at Capitol & Admin. Assistants

PROGRAM DESCRIPTION: Our political system is writhering with public criticism and cynicism. A clean campaign needs direction from communication professionals. Therefore, this course, taught by Wisconsin political PR and advertising people will help teach people the steps in planning a limited political campaign complete with press conferences, press releases, and fund raising. Probable major topics: Creating a Superman - Image Building on Performance; How to Plan a Political Campaign; Techniques of Fund-Raising; Political Polling with Survey and Campaign Uses; Campaign Reform Laws and the Media.

REGISTRATION: FEE: $15.00
Registrants are to complete enrollment form and mail together with correct fee to: (check or money order made payable to UW-Extension)

ETN REGISTRATION
432 N. Lake St., Room 101
Madison, WI 53706

O V E R -------

SCHEDULE CARD
Instructional Communications Systems

Program or Course Title ____________________

City ____________ LPA ____________

WE DO NOT INTEND TO COMMIT FACILITIES AT:
(LPA's with multi-locations, select locations not to be scheduled.)

☐ Courthouse ☐ Library
☐ Campus Center ☐ ____________

COMMENTS:

EXHIBIT 3 (above)
EXHIBIT 4 (left)

UWEX

University of Wisconsin-Extension

Instructional Communications Systems 1975-76

10th Anniversary of Statewide ETN

Your Open Line to the University

When the first telephone was being installed in this country about 100 years ago, its users were lucky to hear someone speak from only a mile away. At that time, few people would have envisioned the telephone's use in what has become the Educational Telephone Network (ETN) of University of Wisconsin-Extension.

ETN itself has come a long way from that first telephone. It started in 1965 with only 18 listening sites around the state. The few listeners might hear the lecture quite clearly one minute, then hear nothing but static the next. As a result, some say telephone repairmen were seen in ETN Madison offices as often as the ETN staff!

While it was up to the telephone company to work out the technical bugs, it was up to the ETN staff and UW-Extension faculty to work out the program details.

The first program was a seminar for physicians, a group that needed classes in order to learn of the latest medical wonders but couldn't afford the time to travel far from their patients.

This first class was a hit and ETN was on its way. The next year, three new health programs were scheduled and the decision was made to start programs for other professionals.

Lawyers, for instance, attended ETN noon lectures while they ate their sack lunches. Over the years, they have had one of the highest turnouts of any group—about 500 per program.

their class assignments to their instructor who critiqued and returned them.

Music was harder to adapt to the system, since it requires a higher level of sound quality than a lecture. The test came in the spring of 1973 with a forum for piano teachers. Artists from as far away as Texas and New York performed—via the telephone lines—and listeners were surprised at the almost concert-hall quality of the sounds. Teachers demanded an encore and the program has been repeated the last two years.

Today ETN is celebrating its tenth anniversary and there are now over 100 UW-Extension courses offered each year to more than 20,000 participants.

A new dimension was added to the ETN idea in 1969 when images could be transmitted along with the telephone lecture. In fact, an additional system was designed and called SEEN, or the Statewide Extension Education Network. With SEEN, the images appear on a screen at the listening site at the same time that the lecturer draws them on an electrowriter. SEEN has made it possible for UWEX faculty to teach calculus, for example, because they can now send out instant equations and formulas. So far, 23 cities have the capability to receive SEEN programs.

New technology will no doubt bring more changes like SEEN. But it's really people like you who will determine the future directions of ETN's programs and use—the adults who ask for educational experiences and the UW-Extension faculty who respond . . . by phone.

Would Alexander Graham Bell believe . . .

. . . This is where his telephone led?

EXHIBIT 5

ETN REGISTRATION

☐ YES! Register me for Science Fiction: [illegible] Imagination, II. March 22, 29, April 5, 12 & 19, 1976, from 8 to 10 p.m.

☐ Enclosed is my check for $[illegible], payable to UW-Extension.

Name______________________________

Street Address________________________

City____________ State________ Zip____

Home phone__________________________

Business phone_______________________

Soc. Sec. No. _______-_______-_______*

Location you wish to attend is:

____

(Select from list at back of brochure.)

*Not mandatory—used only to insure accessibility and accuracy of your educational record.

--------------- Clip & mail today! ---------------

dealing with DISCIPLINE

---

etn

Unless otherwise specified, there is one ETN location in each of the towns listed below. For further information, call the phone number given after the location you wish to attend.

☑ ALMA, 685-4360
☑ ANTIGO, 623-7601
☐ APPLETON, 739-7741
☑ ASHLAND, 682-2804
☑ BALDWIN, 684-3301
☑ BALSAM LAKE, 485-3136
☑ BARABOO
  ☑ Courthouse, 356-5581
  ☐ UW Center, 356-5581
☑ BARRON, 537-3124
☐ BELOIT, 752-5471
☑ BLACK RIVER FALLS, 284-5391
☑ CHILTON, 849-2361
☑ CHIPPEWA FALLS
  ☐ Courthouse, 723-9195
  ☑ Library, 723-1148
☑ CRANDON, 478-2212
☑ DARLINGTON, 776-4494
☑ DODGEVILLE, 935-3354
☑ DURAND, 672-8664
☑ EAGLE RIVER, 479-4797
☑ EAU CLAIRE
  ☑ Courthouse, 839-4712
  ☐ UW Campus, 836-3269
☑ ELKHORN, 723-4900
☑ ELLSWORTH, 273-4376
☑ FOND DU LAC, 921-5600
☑ FRIENDSHIP, 339-7811
☑ GREEN BAY
  ☐ Courthouse, 437-3211
  ☑ UW Campus, 465-2139
☑ GREEN LAKE, 294-6573
☑ HAYWARD, 634-4876
☑ HUDSON, 386-5581
☑ HURLEY, 561-2695
☑ JANESVILLE
  ☐ Courthouse, 752-7471
  ☑ UW Center, 752-7471
☑ JEFFERSON, 674-2500
☑ JUNEAU, 386-4411
☑ KENOSHA
  ☑ Health & Soc Ser Cntr, 658-2044
  ☐ UW Parkside, 553-2312
☑ KESHENA, 799-3641
☑ KEWAUNEE, 388-2542
☑ LA CROSSE
  ☑ Courthouse, 784-9494
  ☐ Library, 784-8623
  ☐ UW Campus, 784-9494
☑ LADYSMITH, 532-5539
☑ LANCASTER, 723-2125
☑ MADISON
  ☐ Library, 266-6388
  ☑ Radio Hall, 262-4362
  ☐ Wis Center, 262-1122
☑ MANITOWOC
  ☐ Co Off Bldg, 682-8877
  ☐ Library, 682-6861
  ☑ UW Center, 682-8251
☑ MARINETTE
  ☐ Courthouse, 735-3371
  ☑ UW Center, 735-7477
☑ MARSHFIELD, 387-1147
☑ MAUSTON, 847-[illegible]
☑ MEDFORD, 748-3327
☑ MENASHA, 734-8731
☑ MENOMONEE FALLS, 251-4030
☑ MENOMONIE
  ☑ Courthouse, 232-1636
  ☐ UW Campus, 232-1636
☑ MERRILL, 536-7151
☑ MILWAUKEE
  ☑ City Campus, 224-[illegible]
  ☑ Co Ext Off, 257-5451
☑ MINOCQUA, 356-5296
☑ MONROE, 325-5181
☑ MONTELLO, 297-2141
☑ NEILLSVILLE, 743-3118
☑ NEW RICHMOND, 246-2364
☑ OCONTO, 834-5322
☑ OSHKOSH, 235-2300
☑ PHILLIPS, 339-2555
☑ PLAIN, 546-4201
☑ PLATTEVILLE, 342-1377
☑ PLYMOUTH, 458-5566
☑ PORT WASHINGTON, 284-9411
☑ PORTAGE, 742-2191
☑ PRAIRIE DU CHIEN, 326-[illegible]
☑ RACINE, 637-8585
☑ REEDSBURG, 524-3316
☑ RHINELANDER, 362-6315
☑ RICE LAKE, 234-8176
☑ RICHLAND CENTER, 647-6148
☑ RIVER FALLS, 425-3877
☑ SHAWANO, 526-6136
☑ SHEBOYGAN
  ☑ UW Center, 458-5566
  ☐ Library, 457-5583
☐ SOUTH MILWAUKEE, 762-8692
☑ SPARTA, 269-6718
☑ SPOONER, 635-3192
☑ STEVENS POINT, 346-3573
☑ STURGEON BAY, 743-5511
☑ SUPERIOR, 394-0363
☑ VIROQUA, 637-2165
☑ WASHBURN, 373-2221
☑ WAUKESHA
  ☐ Courthouse, 544-8080
  ☑ UW Center, 542-8825
☑ WAUPACA, 258-7681
☑ WAUSAU
  ☐ Courthouse, 842-2141
  ☑ UW Center, 845-9602
☑ WAUTOMA, 787-2226
☑ WAUWATOSA, 258-5700
☑ WEBSTER, 866-4201
☑ WEST ALLIS, 476-6550
☑ WEST BEND
  ☐ Courthouse, 334-3491
  ☑ UW Center, 338-1161
☑ WHITEHALL, 538-4341
☑ WHITEWATER, 472-1100
☑ WINTER, 266-3301
☑ WISCONSIN RAPIDS, 423-3000

UW–Extension provides equal opportunities in employment and programming.

Copyright Problems in Media:

school and library uses and abuses

THURSDAYS, 6-7:50 p.m.
November 20, 1975
December 4, 1975

Offered via ETN in a Community near you.

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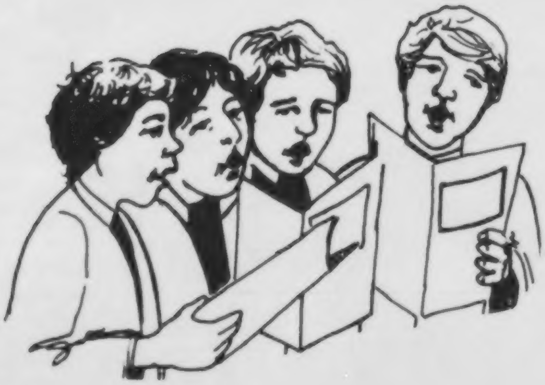
nsin—Extension

HUMANITI
MIDDLE A

A FIVE W
SERIES B

UWE
UNIVERSI



UWEX
UNIVERSITY OF WISCONSIN—EXTENSION MUSIC
in cooperation with the
State of Wisconsin Department of Public Instruction
and in association with
Wisconsin Music Educators Conference
Wisconsin School Music Association
presents

Boys Can and Want to Sing

Three Tuesdays, 6:30 - 7:50 p.m.
January 13, 20, 27, 1976
Via ETN in Every County in Wisconsin

EXHIBIT 6

WISCONSIN
Newspaper Association
33 North Dickinson
Madison Wis 53703
Clipping Bureau Division

Eau Claire
Leader Telegram

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Plan Second Semester County ETN Courses

Varied courses offered through Extension ETN

178

interests

Classes will again be offered by University of Wisconsin-Extension over the Educational Telephone Network (ETN) starting this month at the Eau Claire County Courthouse.

The following courses are available in Eau Claire and other counties through the county extension agent:

Business and Management: creating real estate sales, Jan. 19; Wisconsin real estate law, Feb. 7.

Communication: Cable TV-Video projects, Jan. 14; a weekly diet of public

Engineering: retail advertising, Feb. 4; introduction to statistical methods, Jan. 26; metric system, Jan. 27; pavement design, Jan. 12; alternate sources of energy—wind power, Jan. 29; mechanical engineering refresher, Feb. 2; microprocessors and industrial application—survey of structural analysis, Jan. 29; products liability—engineering and the law, Feb. 3; introduction to aquatic chemistry, March 10; psychrometric processes, Feb. 9; sales techniques for engineering pro-

ings, March 29.

English: teaching creative writing, Jan. 15.

Beekeeping: working with bees for fun and prof-

ting dates for January ed by interest groups,

anagement: Creating , Jan. 19; Wisconsin Feb. 7.

: Cable TV-Video A Weekly Diet of PR, spaper Financial Editors and Publishers, Photographic Works, Article Writing, Feb.

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ETN
EDUCATIONAL TELEPHONE NETWORK
University Extension
Door County

For the music student in Door county's schools, a career in music is no longer confined to teaching and performing.

Music teachers, counselors,

ETN celebrates 10 years

Ozaukee County is plugged into what is often referred to as "the world's biggest party line," UW—Extension's Educational Telephone Network (ETN). This year the ETN is celebrating its 10 year anniversary.

Each year more than 20,000 Wisconsin citizens participate in educational

country about 100 years ago, users were lucky to hear someone speak from only a mile away. At that time few people would have envisioned the ETN program, which began in 1965 with only 18 listening sites around the state.

At last count there were 186 locations in courthouses, hospitals, and

local program administrator for the network.

ETN programs range from music instruction to law. Law courses have been developed for laymen as well as for lawyers. Health and social work professionals and businessmen and women are also heavy users of the University telephone system.

"In the last couple of

EXHIBITS 7 & 8

NEWS from **UWEX**

UNIVERSITY OF WISCONSIN—EXTENSION
Program Information, 625 Extension Building
432 North Lake Street, Madison, WI 53706
(608) 262-1156 or 262-0074

3/17/76

immediately

JRW

LPA's--Please fill in blanks, have retyped on your newshead and mail to area press.
Jeanne Weber

_______________ -- A seminar for __________ county attorneys, "Tax
(your city)

Aspects of Contributions to Charitable Organizations," will be conducted over the University of Wisconsin-Extension Educational Telephone Network (ETN) four Wednesdays starting April 7.

The sessions will be held from 12 noon to 1:20 p.m. and will be repeated at 4 p.m. for persons in the Milwaukee and Madison areas. Persons in ______ County can participate in the ETN meeting room at ______________, ________________,
(building) (address)

___________.
(city)

The sessions will examine the federal and state tax problems arising from gifts to charitable organizations, both from the view of the donor and the organ-

Based on a questionnaire to LPA's on the issue of advertising, there appear to be many pros and cons. Several of the LPA's replied that when they ask for so much free space the editors expect or would appreciate advertising. On the other hand, LPA's replied that if they start to advertise, papers will question why they should use the news releases when they can get paid. Others noted that, when ETN can get 50-80 free stories used, why change?

Posters

Use of posters also is recommended to attract attention and to obtain enrollment. One of the Wisconsin libraries recently designed an attractive poster with a pocket on it for the descriptive program brochures which was displayed in the entrance area of the library with good effect.

In-House Promotion

There are a number of in-house channels that Extension uses in publicizing ETN programs. One is the Community Programs Newsletter to Extension faculty in which program reminders can be made. Another channel is the weekly ETN faculty conference. Here programmers have the opportunity to call their program to the attention of Extension faculty statewide and to discuss its subject matter with them. There is also the Weekly Schedule of network courses which is prepared by ICS two weeks in advance of the program transmissions. (Exhibit 9) It includes information such as topic, clientele, coordinator, system used, if pre-registration is required and if a fee is charged. It is mailed to the Local Program Administrators for posting on bulletin boards, and, in some cases, used as a release to newspapers.

Local County Promotion

The Local Program Administrators play a key role in the promotion and publicity of network programs. They are instrumental in assisting programmers in the direct mail efforts in areas such as:

1. Mailing brochures to people in their counties such as all previous ETN enrollees, homemakers, 4-H leaders and persons who have taken other Extension courses.
2. Distributing brochures and newspaper tabloids to public places such as doctors' and dentists' offices, barber and beauty shops, banks, libraries, post offices, hospitals, YMCA's and YWCA's. Asking supermarkets to stuff them in grocery bags.
3. Speaking to civic groups about ETN.
4. Using radio or TV programs to plug the programs. (Some of the agents have their own weekly programs.)
5. Utilizing shoppers guides for releases or a listing of the upcoming ETN programs.
6. Contacting heads of institutions or organizations to alert them to the programs, and supplying them with brochures.

Through the various Madison Extension offices, the LPA's are provided with the basics of promotion which allow them to carry out their responsibilit for promotion and publicity of network programs.

Registration

In the web of Extension support activities is the Central Registration Office in Madison. Most network registrations, with some exceptions, are processed here, and funds generated from the programs are deposited into the sponsoring department's account. Most of the registration is done by mail in advance of the first program through enrollment forms provided in the program fliers. Completed enrollment forms are either left with the county Extension agent who forwards them to Madison, or mailed directly to the Madison Registration Office with the correct fee. (Exhibits 10 and 11) Copies of the registration form are sent to the registrant, the programming department and the location selected by the enrollee.

A registration summary is given on the network the morning of a beginning program series. In cases of late registrations, locations are notified by telephone so that facilities are made available.

For public service programs which do not involve official registration or fees, attendance reports are completed at the locations. These usually are mailed as an attachment to the Program Announcement and returned to the ICS Office. A standard University Extension attendance report is also used at the locations, and we encourage the LPA's to keep track of attendance for all programs whether it be a fee or public service program.

Registration for Medical Programs is handled somewhat differently. Hospitals contract for ETN on a yearly basis, offering scheduled programs to members of their staff at no charge. Individual registrations are accepted, however, at any of the hospital or county locations, and then the standard registration procedures apply.

Production Services

Program instructors are contacted well in advance to explain production capabilities, to arrange for a demonstration of equipment (for those unfamiliar with this teaching media), and to confirm the production arrangements needed to meet the instructor's plans for the course. Among the production services available to faculty are:

- FACULTY PRODUCTION LAB: A workshop area where faculty may use cassette and reel tape machines, turntable and telephone for easy and convenient recording, editing and listening to program materials.
- U-TAPE-IT STUDIO: A self-operated, push-button control studio in which faculty record lecturers and interviews.
- STUDIO RECORDING AND EDITING: A technician-controlled production service available for single-voice and multiple-voice recordings, such as for role playing and panel discussions. Editing assistance is also available.
- TELEPHONE TIE-INS: Up to six different resource persons or groups may be connected to network programs via telephone calls placed from the master control board.

ETN-SCA
WEEKLY SCHEDULE

April 12 - April 16, 1976

UWEX
UNIVERSITY OF WISCONSIN—EXTENSION
Instructional Communications Systems

Old Radio Hall, 975 Observatory Drive
Madison, Wisconsin 53706 262-4342 Area Code 608

NOTE: Numbers refer to Program Announcement

DAY	TIME	TOPIC	CLIENTELE	COORDINATOR	(1)	(2)	(3)
MONDAY April 12							
	9:00am 9:30am	CP Staff Conference	CP Staff	Woeste/Hegge	ETN/SCA	no	no
	9:30am 9:55am	CP Daily Information	CP Staff	Woeste/Hegge	ETN/SCA	no	no
	10:00am 11:50am	Family Development Dept. Faculty Mtg.	Ext. Faculty	N. Musser	ETN	no	no
	Noon 12:50pm	Ext. Nursing Faculty Mtg.	Ext. Nursing Faculty	S. Cooper	ETN	no	no
	1:30pm 2:20pm	WINS #5	Inactive Nurses	R. Lutze	ETN/SCA	yes	yes
	2:30pm 4:20pm	Prog. Dev./In-Service Ed. #13	Co. Ext. Home Economists	R. Stare	ETN	no	no
	4:30pm 5:50pm	Career Education #78	All Educators	Ferver/Coenen	ETN	yes	yes
	6:00pm 7:50pm	The School & The Law #83	Teachers, Supvrs., General Public	Ferver/Coenen	ETN	yes	yes
	8:00pm 10:00pm	Science Fiction: Keeping Up With Change #99	Teachers, Writers, Librns., General Public	G. Hartung	ETN	yes	yes
TUESDAY April 13	8:30am 8:55am	CP Daily Information	CP Staff	Woeste/Hegge	ETN/SCA	no	no
	9:00am 9:50am	Badger Home/Garden/Family Living Forum	Co. Home Economists	L. Meiller	ETN	no	no
	10:00am 11:50am	Indian Library Service	Public Librns. and Indian Librarian Trainees	M. Fuller	ETN/SCA	yes	yes

(1) Indicates systems on which transmission will be made.
(2) Indicates if preregistration is required.
(3) Indicates if fee is required.

EXHIBIT 9

UWEX UNIVERSITY OF WISCONSIN–EXTENSION
RADIO HALL MADISON, WISCONSIN 53706 AREA CODE 608 262-4342
INSTRUCTIONAL COMMUNICATIONS SYSTEMS

TO: ETN Students

FROM: Lorne A. Parker, Director, Instructional Communications Systems

RE: LOCATION & OPERATION OF ETN EQUIPMENT

Welcome as a student enrolled in one of the many programs transmitted via the Educational Telephone Network (ETN). According to the enclosed registration receipt, you have selected an ETN location indicated on the registration material.

Educational Telephone Network

ETN is a private telephone network used for the transmission of educational programs throughout Wisconsin. It takes the form of a huge party line with stations located at courthouses, UW campuses, libraries, and hospitals in approximately 100 Wisconsin communities. Each station has identical equipment: a speaker and four microphones. This two-way equipment enables a person at any ETN station to hear anything transmitted on the network as well as to participate in discussion with all other points on the network. (See reverse side for "How to Work Station Equipment.")

Helpful Hints for ETN Students

1. If you have any questions regarding your class, or would like to know specific room locations of the ETN facilities, call your local University Extension County office.
2. Arrive 15 minutes before the first scheduled class begins.
3. Make sure the ETN equipment is operating. Many times there will be a program prior to yours but if not, music will be transmitted so that you can adjust the volume and transmission quality.
4. To ask a question or make a comment, depress the bar on the base of the micr
micropho .

Any comments

8/74

UW-E›

A PROGRAM OF UNIVERSITY OF WISCONSIN - EXTENSION
UWEX

PHOTOGRAPHIC MASTER CLASSES
TUESDAYS, 8:00 - 9:50 P.M.
SEPT. 16, 30, OCT. 14, 28,
NOV. 11, 25, DEC. 9, 1975

LOCAL CONTACT: MILLIE SEAMAN 262-4342
ETN LOCATION: MADISON, OLD RADIO HALL

SOCIAL SECURITY NO.
345-30-1354

JOHNES, JONES
303 E. Gorham
Madison, WI 53706

HOME PHONE: BUS PHONE:

FORM UW(22) - 244

REGISTRATION OFFICE
FEE $ 30.00
TOTAL
PREPAID
BALANCE
CASH OR CHECK NO.
CLERK

EXHIBIT 10 (right)

EXHIBIT 11 (above)

- TAPE DUPLICATION: Cassette and reel copies of programs available for purchase by faculty and students.

The ICS facilities are available by appointment and are under the supervision of an ICS technician.

Program Format

Instructors are contacted one week to two days prior to a program to determine the format necessary for the production worksheet which is submitted to the network engineer for use at transmission time. Followups are made with the instructor during the program series to acquire the precise format for each program.

Evaluation

This is the final component of the program planning process. An evaluation system called the Program Evaluation Checklist (PEC) was developed in order to determine if appropriate education techniques were designed into network programs. Through this evaluation system, the relationship between the communications system and the educational objectives of the program can be studied. The use of an evaluation system is a cooperative effort between the department programmer and ICS, with all evaluation instruments and materials supplied by ICS. Their efforts lead to a tailor-made evaluation checklist which is mailed in advance of the last session to the LPA with complete instructions on how to administer it.

Data from the evaluation is interpreted with faculty in terms of program strengths and weaknesses, and serves as an aid for improving future programs. Although not all programs are evaluated, informative evaluation is going on all the time about the worth of the programs, whether they are programs in the general or public service category. ICS does receive some form of feedback from the instructor and students on most of the programs.

Local Program Administrator (LPA)

The various functions of the Local Program Administrator have been mentioned in preceding sections, however, the role of the LPA and the effect of his efforts in the county need to be fully understood. The LPA is usually the chairman of the County Extension Office who has been designated by the District Director to assume the responsibility for coordinating network programs in each county. He is responsible not only for the scheduling arrangements through the Program Announcement procedure, but has the overall responsibility for the administration and promotion of programs on the county level. These responsibilities include:

1. Equipment security and trouble-free operation
2. Establishment of a program information base
3. Localizing press releases
4. Actively informing clientele groups of specific programs
5. Direct mail efforts
6. Handling walk-in registrations
7. Handling room assignments
8. Keeping track of enrollments
9. Distribution of program materials: printed handouts, slides, evaluations, attendance sheets
10. Identifying, hiring, and training Aides to assist with the administration and promotion of programs

Aide Program

A committee of Community Programs faculty was appointed in 1969 to assure a more effective operation of ETN in reaching people with Extension programs. The committee recommended that "para-professional" people be hired to assist in staging ETN programs at the County Extension offices. In line with this recommendation, a pilot program was initiated in 1970 with one location in each of the eight districts. There were immediate, measurable, beneficial effects in all of the eight pilot locations, such as:

1. Increased attention given to the promotion and publicity of ETN programs, resulting in more activity and offerings of ETN programs.
2. More personalized service to clientele, making the system available to small groups and/or individuals, resulting in "satisfied customers."
3. Freeing the county-based Extension faculty's time by eliminating many of the "chore jobs" from their work load.

Since then, funds have been allocated to the District Directors for the hiring of Aides statewide on a yearly basis. Today more than 50% of the counties have Aides who assist the LPA's in performing various duties involved in the administration, coordination and promotion of programs.

To provide added support, ICS conducts in-service training programs on the network for Local Program Administrators and Aides at the beginning of each academic year. Specific questions from the locations can be answered and ideas shared concerning any related subject. Last year an independent learning package was put together providing cassette tapes and printed materials which cover all aspects of the network operations and procedures. The learning package serves as a ready reference for the Aides in their daily involvement with the programs, and reation to it has been positive.

Conclusion

After a life span of ten years, ETN is no longer a new media to Extension faculty. The program requests for network time are proof of that. ETN is now a viable statewide communication system linking all county offices, most UW System campuses, over 50 hospitals, plus various libraries and high schools. ETN is being used routinely not only for weekly staff conferences and continuing medical education seminars, but for a cross section of programs reaching thousands of people. Moving programs from the initial planning phase to their ultimate transmission involves considerable support activity, coordination and cooperation. Through the collaborative efforts of Extension faculty, various techniques have evolved to help systemize the total network operation. And it is through Extension faculty and its strong organizational structure that the network has become the successful operation it is today.

DESIGNING TELECONFERENCE PROGRAMS: SOME CLUES FROM THE WISCONSIN EXPERIENCE

Marcia Baird
Assistant Director
Instructional Communications Systems
University of Wisconsin-Extension

Wisconsin's Educational Telephone Network (ETN) and the Statewide Extension Education Network (SEEN) are new mediums in an historical perspective.

Although these teleconferencing systems are a means to an end in Wisconsin--delivery systems for the entire state--access to them isn't enough. Users need to know how to design programs specifically for these media, media that are similar to and different from other educational systems.

In contrast to the scores of experiments comparing the effectiveness of telelectures versus traditional face to face classroom learning, few studies have focused on the design of teleconferencing system programs.

Fortunately, there is a considerable amount of research on adult learning in face to face situations and via other media that's at our fingertips. In Wisconsin we can also glean valuable insight into teleconferencing program design from a decade of programming experiences.

By paying attention to adult education literature and actual programming experiences, we can make an intelligent attempt at designing teleconferencing system programs no matter what our specific educational objectives.

It will be my attempt in this paper to illustrate how Wisconsin's faculty, using the ETN and SEEN systems, have operationalized implications of adult learning research into statewide classroom practice. Initially the focus will be on general guidelines or "ideas to think with" that seem paramount to teleconferencing program design. Then the focus will shift toward how programmers operationalize those "ideas" into specific techniques for program organizers, formats, discussion and feedback.

"Ideas To Think With" About Teleconferencing Program Design

From adult learning research, a decade of ETN and SEEN programming experiences in Wisconsin and many informal conversations with faculty, there are some general guidelines that need to be considered in teleconferencing program design.

Short Learning Segments or "Much Rather Than Many"

A rule of thumb used by many educators is to present no more than three major ideas in each half hour program segment. According to G. W. Hartmann[1], much rather than many should be the pedagogues' curricular watchword.

In a discussion of general principles for patterning learning, J. K. Brilhart[2] states that greater learning and more satisfaction were found in groups where the average number of distinguishable topics per two hour discussion was less than eleven than in groups where the average was more than fourteen.

As the amount of material increases, short term retention decreases. H. J. Klausmeier[3] suggests that this may happen because a large amount of material is difficult to rehearse effectively, or because presenting a greater amount of material increases the chances for interference between items held in short-term memory. He states that one clear implication for instruction is that large amounts of information should not be presented in a short period of time if the intention is to have it learned and recalled.

Because of the "much rather than many" principle, tied to the fact that adults don't listen intently for very long, many of Wisconsin's teleconferencing programmers present a limited number of well developed ideas into their programs and try to change the pace of those programs about every 10 minutes, even if it involves using the question and answer technique to break up pure listening.

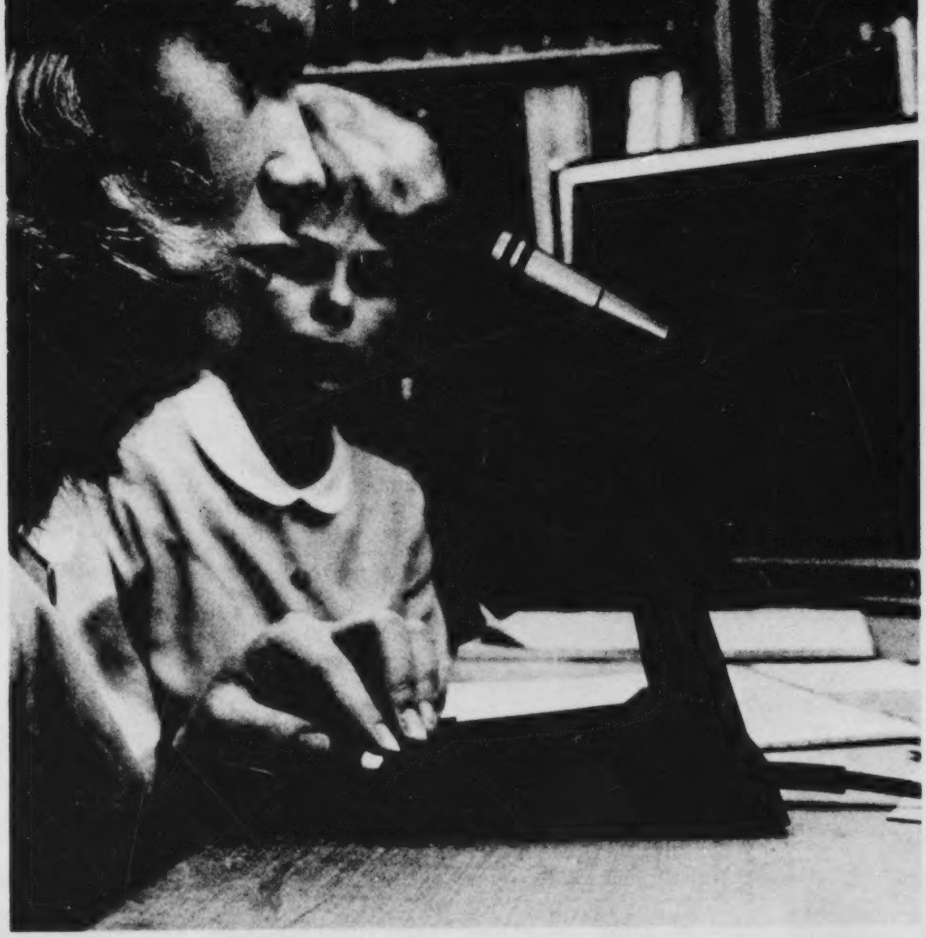
Active Student Participation

Teleconferencing systems programs should involve participants in more than listening. One of the principles of the stimulus-response theory, according to E. R. Hilgard[4], is that the learner should be active rather than a passive listener or viewer. Learning by doing is still an acceptable slogan. "Doing" or participating on ETN can take many forms. More often than not it's mental work like asking or answering a question, discussing a problem or brainstorming. But it can be periods of physical activity. During a program on Creative Design With Wood, one ETN instructor actually had his participants using hammers and blocks of wood at each site to gain some hands-on experience with the technique being discussed. Whatever the form, spoken or written, overt or covert, active student participation is an important process between students and instructors.

Repetition

On a largely audio medium, teleconferencing instructors have found that students do listen to them intently for short periods of time. If there is interference of any kind, such as a chair shuffle at a site or noise from the hallway, instructors have found that students may become confused if frequent repetition is not built into the program.

In discussing listenability and its relation to readability, G. R. Klare[5] states that spoken material has the tendency to drop from memory rapidly without the possibility, as in written material, for the reader to go back to an earlier word, phrase or section.



WHATEVER THE FORM, whatever the subject matter, active student participation is a key design element in teleconferencing programs.

Repetition is often the answer during teleconferencing programs. The amount of repetition required will probably increase as the number of ideas and discrimination among those ideas increase.

To overcome the effects of forgetting and interference, various forms of organizers have been used by Wisconsin faculty, including study questions, verbal interim summaries and session summaries and assignments.

Feedback

Assessment is important both for the teleconferencing student and instructor. There are many assessment exercises that can give the student feedback about his achievement.

In addition to easing communication difficulties, R. V. Harnack[6] states that rephrasing is one of the best sources of feedback. He suggests that every group have a rule that no one be allowed to disagree with another's argument until he rephrases that argument to the satisfaction of the originator. Other assessment exercises can be verbal responses to study questions, short assignments and other simple activities besides formal testing.

The instructor, too, needs feedback about course content, presentation, delivery and whether it's meeting the needs of students. Wisconsin's programmers have developed a variety of techniques for feedback for both instructor and student.

Program Design Techniques

Wisconsin teleconferencing users have developed a repertoire of techniques to operationalize the guidelines about "much rather than many," student participation, repetition and feedback. Four major program design elements have been selected and will be presented here with examples of how they have been put to use in Wisconsin.

Program Organizers

One thing about which adult education research leaves little doubt is that learning increases when the organization of a program is made very clear. Teleconferencing programmers in Wisconsin have developed a number of steering wheels or organizers to prepare and direct students who are scattered all across the state, sometimes with only one or two at a location.

David Ausubel[7] states that a key variable involved in meaningful learning is how the material is organized. In order to present material in a meaningful form, he suggests that the instructor use various forms of organizers. B. B. Proger and R. G. Taylor[8] cite three types of conceptual aids: advanced organizers, concurrent organizers and post organizers.

Advanced organizers used in conjunction with teleconferencing programs have included a welcome letter to students before the class officially starts, information in the course brochure about suggested readings before the course begins, article reprints with key points underlined, a syllabus outlining activities learners might want to participate in prior to the course or such verbal clues as "Today we'll be presenting three roots of sex stereotyping in the schools."

Concurrent organizers can be identified as statements like, "Let me cite one example and statistic to support that view," typographical cueing on the session's topographical outline or slides which are used in conjunction with the teleconference presentation.

Post organizers might include a verbal summary of conclusions or a restatement of the problem discussed in terms of the issues resolved and remaining, or perhaps a sheet of 12 to 15 study questions that students should be able to answer after the discussion or from reading material.

Here is how Wisconsin's teleconferencing instructors use various organizers:

Welcome Letter

Once students have registered, and before the first meeting, some instructors prepare students for the teleconferencing learning experience by sending them a welcome letter. The letter might include a brief explanation about the system, program and course objectives, a first assignment and course written materials so that the student can immediately see the scope of the course.

Biographical Sketches and Picture

Students are often interested in getting to know their instructors and any guest speakers as people. Such a steering wheel for students might be some biographical information about the instructor and any guests and a picture or two. Some teleconferencing coordinators and instructors have included their picture and brief autobiography in the course brochure or distributed it along with the handout material after registration or for the first program.

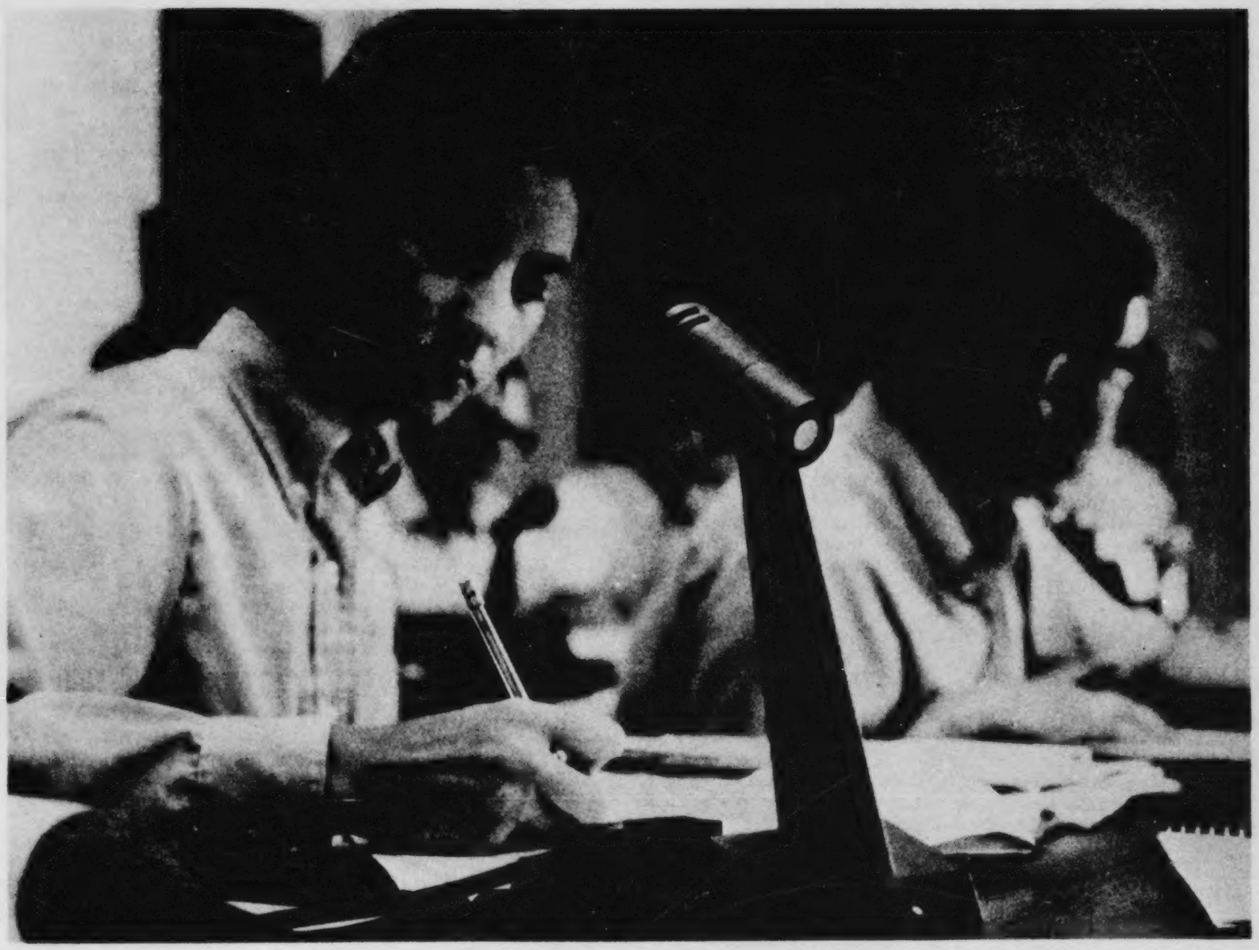
Key Student Information and Roster

It's a challenge to get acquainted with a statewide teleconference class. One way to orient the instructor and the students to the makeup of the geographically dispersed group is to secure some pertinent information from them. Some questions on present position and occupational and educational experience might be asked on the course brochure registration blank. Another method is to use a 5 x 8 index card that are sent to students to complete during the first session of the program. This card may ask them further details about professional experience, educational background and reason for taking the course. In addition to providing valuable background information for developing course direction and discussion, the information can be condensed and used on a class roster to be distributed to all students. This biographical data, backdropped by students identifying themselves and their location before speaking, also helps personalize the teleconferencing system.

Written References and Guides

Topographical Outlines. Topographical outlines for the program sessions help structure subject matter for students and focus attention on certain points. Outlines spread out over two or three pages also have been helpful to students as working note sheets.

Points on the outline can also be enumerated for easy reference. One education instructor, for example, developed a pattern for each ETN session with a topic and topic outline. In ETN session 3, the topic



WISCONSIN INSTRUCTORS TRY to change the pace of their teleconferencing programs about every ten minutes, even if it's only to slide from pure listening situations to question and answer.

outline was numbered with a major heading of 3.1--Growing Interest in Vocational Education. Then the outline was subdivided with points 3.11, 3.12, 3.13 and 3.14. The instructor always tried to refer specifically to a subpoint during the ETN program. If he was talking about 3.21, that was the Northwest Ordinance. This way students could follow easily.

Abstracts. Instructors have also supplemented program sessions with an abstract of a page or two of additional readings. This device is particularly geared for students in the state who don't have ready access to a library and/or some of the subject matter journals.

Activity Syllabus. In addition to outlining content, a syllabus may also outline activities that learners might participate in before and after the particular program.

Bibliographies. Instructor's bibliographies and bibliographies of library materials, free publications or resources people might use in their own self-directed activity following the program could all be included.

It should be noted here that one of the important things for students, especially in statewide teleconferencing programs, is that they have access to reference material. To minimize this possible frustration for students in remote locations of the state, ETN courses have developed strong working relationships with the University of Wisconsin Extension Library service. Libraries of reference materials have been set up in some state locations and also students have been encouraged to mail-in their requests to the library for additional references.

Study Questions. The instructor could also compose 12 or 15 study questions per session that students could answer either from anticipated discussion or from reading material. Often this list of questions could serve as a summary device to a program or as a basis for class discussion. Identifying any questions on the list which students were unable to answer gives them additional guidance--a kind of post organizing device so that they can sense what kinds of questions they should be able to answer.

Verbal Cues. In addition to various forms of printed cues, participants in teleconferencing programs can be prepared and guided with such verbal cues as, "We will now discuss four roots of sex stereotyping in the schools."

Harnack[9] states that announcing the organizational pattern is a valuable use of road sign messages during discussion. By setting the boundaries of his own message, the instructor alerts others to what is coming and to how they can expect it to arrive.

In verbal cueing, B. Rosenshine[10] indicates that a pattern which presents a structuring first, follows it with details and concludes with a structuring statement, is more effective than either an inductive or deductive pattern of explanation.

Program Formats

ETN and SEEN programmers have developed and now use a variety of program formats. The classification of these presentation forms into separate categories as presented here is to a certain extent artificial because often they overlap. However they are simply presented here to illustrate that no one technique, or combination of techniques, is more effective than others for teaching adults via ETN. The formats each instructor uses emerge from such influences as the subject matter being discussed, instructional objectives and audience. Formats may move from lecture to buzz groups, slide from panel discussion to brainstorming or from lecture to role playing. Periods of group activity are important parts of many Wisconsin programs.

In addition to giving students an opportunity for active participation, D. C. Barnlund[11] states that group problem solving activities have the advantage of suggesting more hypotheses and bringing more knowledge to bear upon the solution of the problem than any one individual. The combined critical thinking of everyone in the group is much more likely to catch and correct deficiencies in evidence and reasoning than an individual might, and group interaction seems to have a stimulating effect upon the performance of individuals. R. M. Gagne[12] states, however, that the inclusion of the discussion group technique is a decision which emphasizes knowledge transfer, cautioning that initial knowledge is a prerequisite to a discussion class, not a part of it.

Although particular groups such as clergy may enjoy rapping with one another, it has been found that some groups won't "buzz" on the network. People may ask questions in these situations on the network, but they won't make statements, possibly because the voice on the network may be seen as an authority figure.

For this reason and to simply include student participation in their programs, extensive use has been made of group work at the individual locations. This may range from role-playing to discussion of case studies to developing a group presentation.

To facilitate local group discussion and activities, teleconferencing program coordinators often designate one person or a team of leaders at each site to act as group leaders. N. R. Maier and A. R. Solem[13] found that leaders significantly improved the quality of group decisions by giving the minority a greater voice than was possible under leaderless conditions.

Lecture

The lecture is a popular teleconferencing format among doctors, nurses and attorneys. They're used to learning in this way and it's efficient. Large numbers of facts, new information or review material can be presented in a short period of time. On the Wisconsin system, however, it's not just a lecture. The teleconference lecture is reinforced in many ways by supplementing the verbal material with written organizers. Prior to the program, students may receive skeleton outlines so that they can easily follow the lecture and take notes right on the outline. Significant visual materials may be incorporated into handouts. A study question list, bibliographies, additional reading sources and perhaps an instructor's picture and bibliography may also be in the packet supplementing the session. Sufficient question and answer time is allowed for two way communication so that students around the state can clarify speaker ideas, support or dispute material and use their own experiences to carry discussion into personally relevant areas.

Celebrity or National Expertise

Well known national and international authorities are frequent guests on Wisconsin's teleconferencing systems. Guests of this caliber not only attract students to the program, but are rich teaching and learning resources and interest-holders. Guests are easily and inexpensively connected to the ETN network via long distance telephone, usually from their homes or offices. Main presentations may be given during the actual program or prerecorded. If prerecorded, resources are then connected live for discussion. Guest speakers should be informed on any special directions they should take during the program and sometimes there is a biography exchange. In addition to the class receiving a biography of the resource person, it might be helpful, too, to conversely send a class roster with some background information as it's related to the field under study, to the resource person. It may also be helpful for guests to listen to tapes of past programs in the series in order to analyze what has already happened and been discussed.

Student Reports

Individual or group student reports are frequently used in education and communication programs. Example teaching no matter what the subject area, helps bring the program down to earth and stimulates interest. The sharing of experiences also personalizes the teleconference learning experience.

Interviews

Interviews of 10 to 15 minutes can bring out key ideas in many programs and uncover information not generally available. Interviews may be between two people at the same teleconference site, between different sites or perhaps prerecorded. An education instructor frequently asks his students what resource people they would like to hear and question during a teleconference session. During the program the instructor interviews the guest with about 5 to 8 questions that students have sent in. Following that segment, the network is opened up so that students can carry the discussion into other areas. Prior to the interview, students may be encouraged to do supplementary readings to broaden their base of discussion and add to their understanding of the session topic.

Panel Discussion

Panel discussions can be used effectively to identify problems to be considered, to explore an issue, to give participants an understanding of the component parts of a problem, to weigh advantages and disadvantages of a course of action and to create audience interest in the issue.[14]

Panelists may be located anywhere in the state or country. The variety of voices composing a panel also helps hold listener attention. Panels should not include more than four different people, however, because statewide participants need to be able to distinguish voices. And, as with any panel discussion, a moderator helps keep the topic in focus.

Again, bibliographies and other appropriate support materials for the panel discussion should be sent to students prior to the program.

Reactor Panels

Reactor panels can improve program communication, particularly clarification of important points and ideas. Panelists represent the entire audience by reacting to a speaker's presentation. To be successful, the speaker panel members and the moderator should agree on program objectives and procedures before the actual teleconference. Because of large enrollments and limited program discussion time, reactor panels can also efficiently cover common audience questions. Once these questions are covered, the network can be opened up for other questions by statewide participants.

Role Playing

Role Playing serves as an excellent way to get into the other man's shoes and makes discussion more realistic. An ETN program for social workers and foster parents in Wisconsin frequently uses short vignettes to convey foster parent feelings. Skits can be prerecorded prior to the program or can be improvised to fit in with an individual's conception of his or her assigned roles. Structured role playing, where the script and performance are carefully planned out prior to the presentation, work well on teleconferences. A suitable introduction and problem solving discussion following the skit are also needed to meet intended objectives.

Group Activities

Buzz Groups. Wisconsin teleconferencing participants frequently split into small subgroups at their sites during a program for brief discussions. Water supply operators use approximately 20 to 30 minutes of their two hour programs for local discussion. The buzz group is often used following a lecture or panel discussion. The instructor usually indicates what particular topic the buzz groups should consider and sets a time limit. This format is used as a means of generating questions from the audience while giving everyone in the group a chance to participate in the formation of those questions. Group leaders at each site can serve as resource persons, thus alleviating handling common student questions. A representative from each group usually then reports back to the group through questioning or offering group conclusions.

Case Study. Case studies may be particularly helpful if the objective is to have participants search out information or think through and attempt to formulate possible solutions to problems. Clergy enrolled in a Parish and Personal Conflict: Disaster or Opportunity Series were encouraged to bring with them written case studies of conflict situations they were currently facing or had recently faced. This information then became the agenda for group consideration by each location. Spokesmen for each group reported on how the site analyzed phases and aspects of the study to the statewide class.

Group Project Sessions. An agricultural engineer who works with 4-H woodworking leaders via Wisconsin's ETN system includes some periods of activity in his programs. In a wood identification program, for example, he devoted the first half of the program to laying the basic background information on the topic. The second half of the program involved actual wood identification by participants at each site.

INSTRUCTORS CAN TRANSMIT much of their personality through a microphone. To help students get to know them even better, however, some may send out a picture of themselves and a brief biography.

Packets containing a wood identification key and wood samples were sent to each site. The instructor would work with the group by saying, "Okay, pick up piece of wood marked number 1. Now let's look at it and tie it into the key. Does it have that characteristic, does it have this characteristic?" After working down the key for practice, he'd ask the students to take the second sample and trace it down the key and come on the network when the group felt they had identified it.

Brainstorming. Brainstorming is a simple concept for getting the most creative energy out of a group discussion. Network brainstorming sessions have ranged from collecting a large number of ideas about Wisconsin heritage programs to ideas for a weekend conference for forest owners. According to R. V. Harnack and A. F. Osborn[15], the problem to be brainstormed has to be specific, simple and preferably familiar. After the program rules are explained, teleconferencing programmers simply open up the network for ideas. The quantity of ideas is more important here than the quality, and freewheeling is invited. Editing and synthesis are usually accomplished after the teleconferencing session.

Pre and Post Teleconference Discussion Sessions. A method used successfully by several teleconferencing groups is a warmup session prior to the actual program. Groups at each site may be asked to meet an hour before the teleconference time to work on small group projects, case studies or discuss readings in face to face groups. Some instructors have found that when it's time to begin the program, students are eager to share their ideas, thoughts and comments with the instructors and other students over the network. On site discussion is also frequently scheduled for the hour following the teleconference session.

Program Discussion

Active student participation stands out as a clear guideline in educational research. In many forms, with many different kinds of subject matter, participation has almost invariably been found to contribute to learning.

To elicit statewide discussion and discussion among participants at individual sites, teleconference instructors have incorporated several discussion tools into their programs.

The question is the chief verbal tool for shaping and modeling interaction in the "classroom," according to B. B. Hudgins.[16] As a guide for questioning, N. M. Sanders[17] suggests that instructors aim at devoting at least one third of the class time to questioning above levels of memory.

Stimulating discussion among 150 students scattered across 43 locations, for example, is a challenge for teleconference instructors. Some general guidelines faculty use to secure involvement include creating a climate in which everyone feels psychologically a part of the statewide group, being hypersensitive to attempts to enter discussion and areas of potential confusion, and calling on individuals who have work experience relating to the discussion.

During teleconferencing sessions, instructors may often be greeted by periods of seemingly awkward silences. Pauses, without being able to read visible reactions, may cause panic. It should be understood, however, that pauses may be necessary for students to think through a question.

Although active student participation through discussion is generally seen as a positive feature, it does have some limitations. In addition to it taking time, discussion spreads out responsibility so that students can frequently come to a group with little preparation and let others carry the ball.[18] When an instructor can't look his students in the eye for a response as is the case in a teleconference, it may be especially easy for students to sit back and avoid entering into the discussion. To alleviate this, Wisconsin faculty use several delegation techniques which will be discussed here.

And finally, the interaction potential among teleconference participants will be reduced as the class size increases. For this reason many programmers incorporate group activities into their sessions so that students at each site will have an opportunity for dialogue with others.

Linking Up With Student Background

Questions can be devised more easily if the instructor knows something about the students' backgrounds. One of the best ways of getting teleconference participants into the discussion is to ask them to contribute information in an area in which they have specific knowledge or background. Keys to linking up with the situation and experience of students can be obtained through the course brochure registration blank or from special index cards filled in by students.

The instructor having the names of students in front of him, along with some of their work experience, for example, can help draw them into discussion. If the instructor is talking about apprenticeship, for example, and he knows from his list that there are five people in the statewide class who either work with an apprentice or are associated with an apprenticeable occupation, then he can direct some questions specifically to those people. In addition to gaining participation, this technique also helps personalize the teleconference experience for learners.

Plant Questions

Planting questions among several statewide enrollees is another technique used to encourage two way dialogue. Instructors can prime several students before the session to have some questions ready if discussion is slow to start or lags. Moderators also usually ask questions themselves, particularly trying to anticipate the questions of the person in the state who hesitates to enter into discussion.

Assign Feedback

Assignment reporting during roll call or other parts of the teleconference program is another participation tool. Short student reports of about 3 or 4 minutes can easily be incorporated into teleconference programs. Course handouts can also be used to generate assigned feedback. Instead of pinpointing individuals to respond to an assignment, the instructor could simply say, "I'd like to have the people at Green Bay be ready to respond to the following questions during the next teleconference session." When the class has ended, he knows those students are going to work together.

Feedback

Feedback for both the statewide audience and the instructor are important elements needed in teleconference programs. Faculty have developed a variety of methods, both formal and informal, that build on the immediate kinds of feedback received by both students and instructor during the program.

Visit Sites

By originating teleconferencing programs from a number of different statewide locations, an instructor can give his students important feedback about their progress as well as gain insight into how the course is being received by students. Instructors may visit students in their work location prior to a program and then meet with the local class an hour before and an hour following the program. Students at satellite locations are encouraged to travel to that particular location for that session.

Face to Face Group Conferences

A group conference with all the students in the northern part of the state, for example, or a conference held in conjunction with another event such as the Wisconsin Teachers Education Conference can also provide valuable feedback and personalization for instructors and students that may not be possible during actual teleconference program time.

ETN-O-GRAM

This device for feedback from students was a regular invitation to one ETN class to send in written comments about the class, or to ask questions not brought out in statewide discussion. Other instructors continually urge their students to write or call them if they have comments or questions about the course between teleconference sessions.

Instructors Listen to Students and Themselves

Listening is a requirement for the group leader. If the instructor is to discover student goals, he must listen to them during the teleconference session and in every other opportunity he has. The very art of listening convincingly demonstrates to the student that someone cares about him and his problems. Everyone needs sympathetic audiences, and when we find someone who cares enough to listen, we can scarcely escape involvement in the group he represents.

For the instructor, listening to himself on tape may also give insight into how he listens to others. Tapes of teleconference programs in Wisconsin are available for each session and many instructors make it a practice to listen to their last class session before preparing for the next.

Student Evaluations

Throughout the course some instructors have asked members at a site to collectively fill out a weekly evaluation sheet in order to give them immediate feedback on whether or not they were on base with the topic.

Periodically, other instructors have asked students to respond in written form to the open-ended statement, "My general reaction to this class and the technique by which it is being taught..."

Another kind of student evaluation system used by some teleconferencing programs is the Program Evaluation Checklist. The purpose of this instrument is to study the relationship between the telephone system of communication and a program's educational objectives.

The PEC was developed by communication educational specialists and content specialists based on variables common to the concerns and interests of both. Specifically the PEC consists of a list of statements which define aspects of program content, organization, materials, lecturer, physical facilities and technical quality.

All students in selected programs are asked to complete the questionnaire by rating each statement on how well it describes the program. The scale is numerical, ranging from 0 to 9. Demographic questions are also included in the evaluations to obtain profiles of Wisconsin teleconference students.

At the completion of the evaluation processing, a report is filled out and reviewed with individual instructors. Evaluation materials are confidential between the ICS staff and the instructor.

Group Leader Assessment

Another form of feedback that has been used on the Wisconsin teleconference system is group leader assessment of the program several months after its completion. Using the PEC results and other informal feedback devices, the instructor and the group leaders from each site meet together on the network to interpret evaluation data, share comments and recommend guidelines for future programming.

* * * * *

The techniques presented here for teleconference program organizers, formats, participation and feedback are only a skeletal structure of those that Wisconsin faculty have put into practice.

ETN and SEEN are new mediums of instruction and consequently little research has been done on effective program design specific to them. In order to make an intelligent effort at designing programs for these media, we must continually look at what tools are being used currently, and pick and choose among those that seem most effective for our particular purposes. Coupled with that, we must also be consumers of research in adult education in general and of adult learning research via other media in order to transfer some of that information to teleconference program design.

Clearly there are more techniques presented here and more known about adult learning that can be applied to teleconference programs than most faculty use. Programmers, however, need to continually think with and about teleconference techniques as they design programs focusing on specific instructional goals and audiences.

Footnotes

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ETN: A TECHNICAL SYSTEM

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ETN, Wisconsin's Educational Telephone Network, is a communication system designed to carry university extension programs throughout the state, and to do so with as little interference as possible with the on-going teaching and learning process.

ETN means a number of things to different people who use it. For the student in a remote area of Wisconsin, it is a means of access to college level and continuing education courses not otherwise available in the local community. To extension faculty members, it is a way not to travel. The instructor can deliver courses from his home campus to students throughout the state, eliminating the need to visit each community.

ETN is also a technical system. And to the engineers and technicians who designed and developed it, it is a network of telephone facilities, station equipment, and studio and control rooms that provide instantaneous voice contact between the student and the instructor. The specially designed station equipment is installed at approximately 200 locations throughout the state and interconnected by a network of telephone facilities. This interconnection uses approximately 5000 miles of voice channels and the service of 20 telephone companies to provide statewide coverage. Home base for the system is the Instructional Communications Systems studios and control rooms located in Old Radio Hall on the University of Wisconsin campus in Madison.

The development of ETN took ten years from its inception to reach its present state. Throughout the design and development of ETN, an important concept was applied to every facet of the system: The hardware must be as inconspicuous as possible, and every attempt should be made to minimize the technology that the students and instructors must cope with. Therefore, every effort was made during the design and construction of ETN to provide for easy operation and reliable trouble-free service.

The intent of this paper is to present a picture of ETN as a technical system. We will describe what exists today, users requirements, general design criteria and some of the problems and solutions encountered during ETN's development and implementation phases. The three major components of the ETN system, which will be examined here consist of the network origination studios and control room, the statewide telephone transmissions systems and the individual station location equipment.

ETN as a technical system hasn't always been as it exists today. Earlier attempts at teleconferencing in 1965 used a system much like a business conference call. A network was established through the telephone company operators using existing conferencing bridges. Station equipment consisted of standard desk top speaker phones. These early attempts were sufficiently successful to point out the need to provide programming on a statewide scale. This demanded a larger network with more stations tied together on a scheduled basis.

Transmission systems engineers for the telephone company pointed out the need for a major change in this approach to teleconferencing. On a large scale, the plain old telephone service (POTS), using operator assisted conference calls, was not a reliable means. Conferences were susceptible to many interruptions and delays in network hookups. The telephone company engineers proposed an alternative to POTS, one that would provide the dependable service required. They suggested a network of dedicated lines assigned exclusively to this service and available 24 hours a day.

The network was installed and new station equipment was provided. The new equipment consisted of a four wire telephone and handset with a 106B type speaker/amplifier. (Picture 1) This station equipment was installed in courthouses, hospitals, libraries and on the UW System campuses throughout the state. Locations were changed and installations added as programming and use dictated.

To use the new ETN equipment, a student would turn on the speaker and set the volume for a comfortable listening level at the start of each program. In order to ask a question or participate in the discussion, the student simply lifted the handset and spoke into it. Picking up the handset disconnected the loud speaker from the network. After having asked the question or made a comment, the student would push down the cradle button on the telephone or hang up the handset to allow everyone else at the listening location to hear the response from the instructor over the loud speaker. This equipment, tied together by the effective dedicated transmission system and controlled by the studio in Madison, served ETN users well and prompted rapid growth during the period between 1966-1968. Along with this growth came an increase in sophistication of the users. Students soon overcame the novelty of the new system, and instructors become more complex in their program planning. Users were no longer content with the mere fact that the system worked, and new demands were made of ETN. Technical shortcomings, previously overlooked because of the newness of the system, were no longer tolerated; they turned into glaring faults.

Analysis of system trouble reports identified a number of problem areas. The network's larger size and the resulting increase in transmission system circuit miles, caused the inherent line noise to rise beyond tolerable limits. Telephone system

ETN STATION EQUIPMENT:
4-WIRE TELEPHONE SET AND 106 B SPEAKER/AMPLIFIER

ETN STATION EQUIPMENT:
4-WIRE TELEPHONE SET AND WEBSTER TELETALK SPEAKER/AMPLIFIER

engineers were able to control the noise build up by using the best available circuits and reconfiguring the network into smaller, more manageable blocks. Rapid and changing growth patterns made this a continuing effort.

Additions and innovations in studio and control room equipment kept pace with the changing needs of ETN as a program origination facility. The majority of trouble reports received pointed out shortcomings with individual station location equipment.

The 106B speaker/amplifier was small and unable to provide an even distribution of sound throughout many of the ETN classrooms. As class sizes grew it became difficult for people in large groups to hear the lecture. In order for someone to ask a question over the network, it was necessary for the student to pick up the handset and speak into it. The student would hear the response from the handset ear piece. However, picking up the handset from the cradle cut off the speaker, and in order for the rest of the people in the room to hear the response to the question, the student had to hang up the handset or depress the cradle button. This procedure was awkward and, as a result, made it very difficult for students to participate.

A plug and jack arrangement was developed and installed in various classrooms at ETN locations to provide versatility in room scheduling and arrangements. The handset and speaker were tied to additional equipment mounted at a central location in the building and connected with multipair cable. The multipair jack and plug required proved to be fragile. Resulting broken pins and plugs caused considerable downtime and an unusually high number of service visits by telephone repairmen.

A standardized equipment installation was needed to provide uniform operating instructions, trouble analysis and correction procedures. Though standards were established and detailed instructions sent with each service order, not all ETN station equipment was installed accordingly. One example occurred at a site with a very large classroom. During programs it seemed to take an unusually long time to receive any response from participants at this location. The reason proved to be because the speaker had been installed at one end of the room, and the handset on the wall at the other end. The students clustered around the speaker to hear the lecture,and, when they wished to ask a question, they dashed to the other end to use the handset.

The effort to standardize installations among 20 different telephone companies was an overwhelming one. No amount of instruction seemed to guarantee that each ETN location would be set up the same way. Long delays for new classroom installation were often encountered.

Attempts were made to alleviate some of these problems. Some solutions were only temporary, adopted in order to buy time to develop more permanent ones. A large speaker and amplifier was supplied by the telephone company and installed at locations with large rooms and class sizes. The package was called the "Webster teletalk" and is shown in Picture 2. This helped, but it was clearly not the answer. The need to make it easier to participate over the network still remained. The handset was too restrictive in a spontaneous interactive lecture situation.

About this time, the Bell Telephone Company introduced the 50A telelecture unit. 50A was designed for use on regular 2-wire telephone lines (POTS) and was employed by ICS to connect student groups from around the country to ETN via Direct Distance Dial (DDD). A modification to the 50A adapting it to 4-wire operation seemed like the answer. It provided the three main ingredients--microphones, a speaker, and a voice switch to relieve the user from having to push a button whenever he wished to speak. However, the 50A had some drawbacks. Notably, the speaker was small, which limited the size of the audience, and the set had just two microphones which could only be used one at a time. One microphone was selected to be made live by pushing a button on the set. This restricted its use in a roundtable discussion by slowing down the response from the group using the 50A. This equipment was a definite improvement over the telephone handset, but not the final answer.

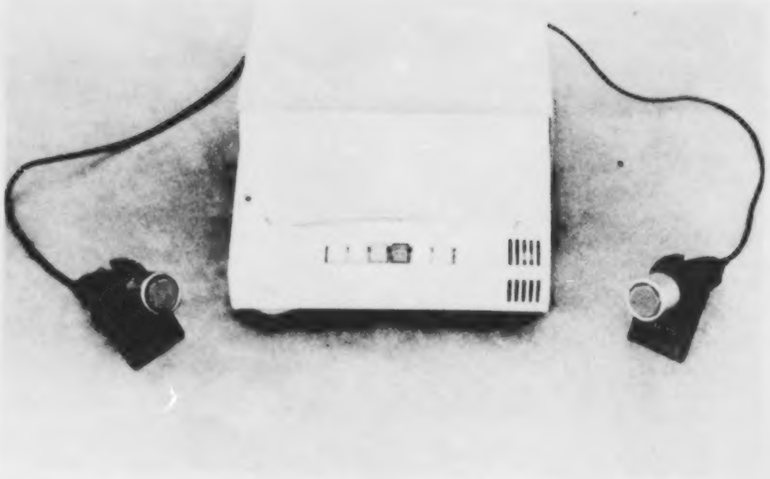
Clearly, some major steps had to be made in the development of the technical capabilities of ETN. A Dean's Advisory Committee was formed to set up general operational requirements needed for a teleconferencing system such as ETN to successfully fill its role as a vehicle for Extension outreach programming. The result of this effort was the following general statement of operational capabilities:

ETN as a teleconferencing system should be able to connect student groups at a large number of geographically separated locations on a statewide basis. This system must provide a communication environment that duplicates, as closely as possible, a single-site discussion group. Equipment at each location needs to make it easy for students to participate and should provide even sound distribution for groups as large as 300 people. The system must be manageable, allowing additions and changes to be made as programming and use require. A central control and origination point should be maintained to supervise the network's technical operation and provide a point from which instructors can originate programs. The transmission system needs to be sufficiently noise free and of high enough audio quality to provide clear, intelligible communication between all points on the network. Ability to connect groups to ETN from anywhere in the world via the regular telephone service should be provided. Methods are needed to recognize and quickly clear any technical problems that may interfere with service. Designs and associated equipment should be of the latest technology, reliable and serviceable. All station equipment, station location interfaces and installation procedures should be standardized throughout the system.

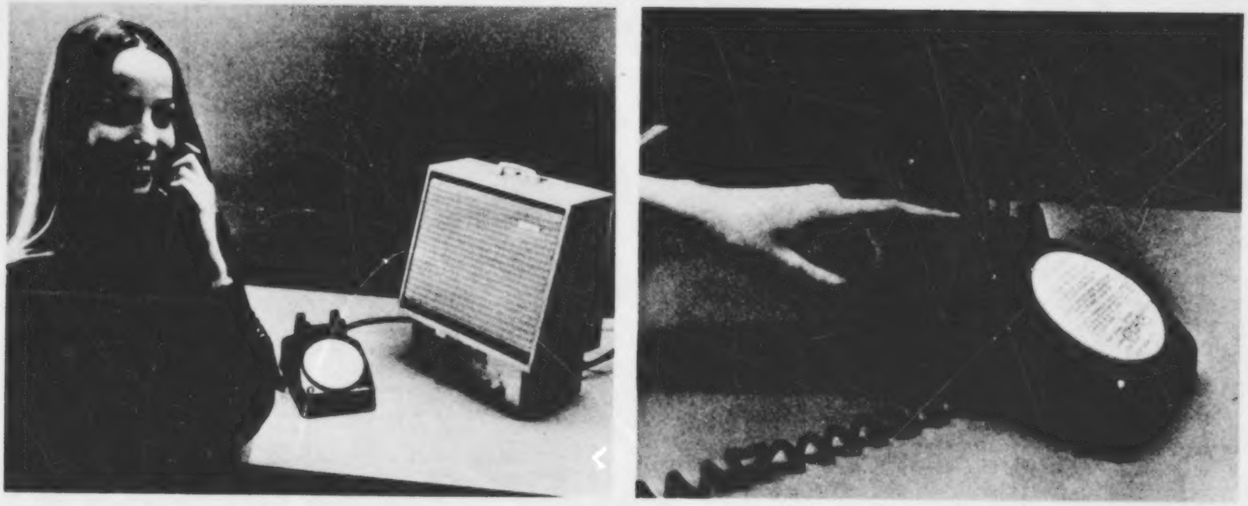
With these guide lines established, an ETN project team composed of ICS personnel, Wisconsin Telephone Company system engineers and marketing representatives worked to implement them.

Existing ETN Station Equipment

Just as guidelines were developed for the entire ETN network, requirements for ETN Station Equipment were also outlined. In 1973, ICS personnel in conjunction with the Wisconsin Bell Telephone Company set forth guidelines which described a nonexistent station package. After interviewing several sound equipment manufacturers, Wisconsin Bell contracted Darome to repackage their existing sound system modules into the required station equipment.



50 A TELEPHONE CONFERENCE SET



TO USE THE ORIGINAL ETN EQUIPMENT, a student had to lift the handset and talk into it. After asking a question or making a comment, the student would push down the button on the telephone so that everyone at the listening station could hear the response over the loudspeaker.

In the fall of 1973, Darome, Inc. delivered prototype station equipment to ICS for evaluation on their 25 point SEEN Network during the balance of the 1973-74 university year. Experience led to refinements in operation and packaging which were incorporated into the Darome Model 604 which is the exclusive station equipment used on the SEEN and ETN networks operated by ICS.

Darome witnessed the educational impact of ETN and the need for similar conferencing equipment on POTS. The Darome Model 610 convener was designed to meet that need. ICS uses the Model 610 for interfacing instructors virtually anywhere in the world via the DDD network. These two models, the ETN station equipment, Darome Model 604, and the POTS station equipment, Darome Model 610, will be discussed here.

Darome Model 604

The Darome Model 604 convener is a self-contained, portable conference set and is intended for use on multi-point, private, 4-wire, voice grade telephone circuits. The 4-wire circuits have a transmit pair and receive pair to all locations. The unit consists of a station receive channel and a station transmit channel. The station receive channel, which processes the signal feed from the network that is fed into the classroom, consists of an input filter, preamplifier, 14 watt amplifier, and three speakers. This audio amplification system is sufficient to provide highly intelligible sound in a classroom seating up to 300 students. The incoming, or received, signal is adjusted by a single control which is readily accessible on the side of the unit. Care has been taken in the design of the station receive channel to minimize telephone line noise outside the speech bandwidth.

The station transmit channel, which enables students within the classroom to feed signals to the telephone network, consists of four highly directional desk top microphones, a microphone preamplifier, an electronic switch and a telephone line driver. To facilitate student participation, each microphone is equipped with a press-to-activate switch and twenty foot cords which allow the

MODEL 604 IN CLASSROOM USE

microphones to be placed around the classroom for easy access by students. With the microphone within reach, the student can respond to network programming by simply pressing the switch and speaking. A jack is provided on the basic unit to extend the number of microphones in a single classroom to eight with the addition of a Model 605 mixer. This process can be continued up to 12 or 16 microphones by using additional mixers. Microphone signals are not only fed to the network via the station transmit channel, but are also fed to the receive channel amplifier. Thus, the conference set may function as a public address system for its own room. The public address volume is set at a predetermined level in relation to the station receive signal. Single control operation of the unit minimizes set-up and acoustic feedback problems.

The Model 604 is housed in an attractive woodgrain vinyl cabinet which has clean lines for storage. Adequate space is provided in the cabinet for storing the microphones and their associated cables.

Darome Model 610

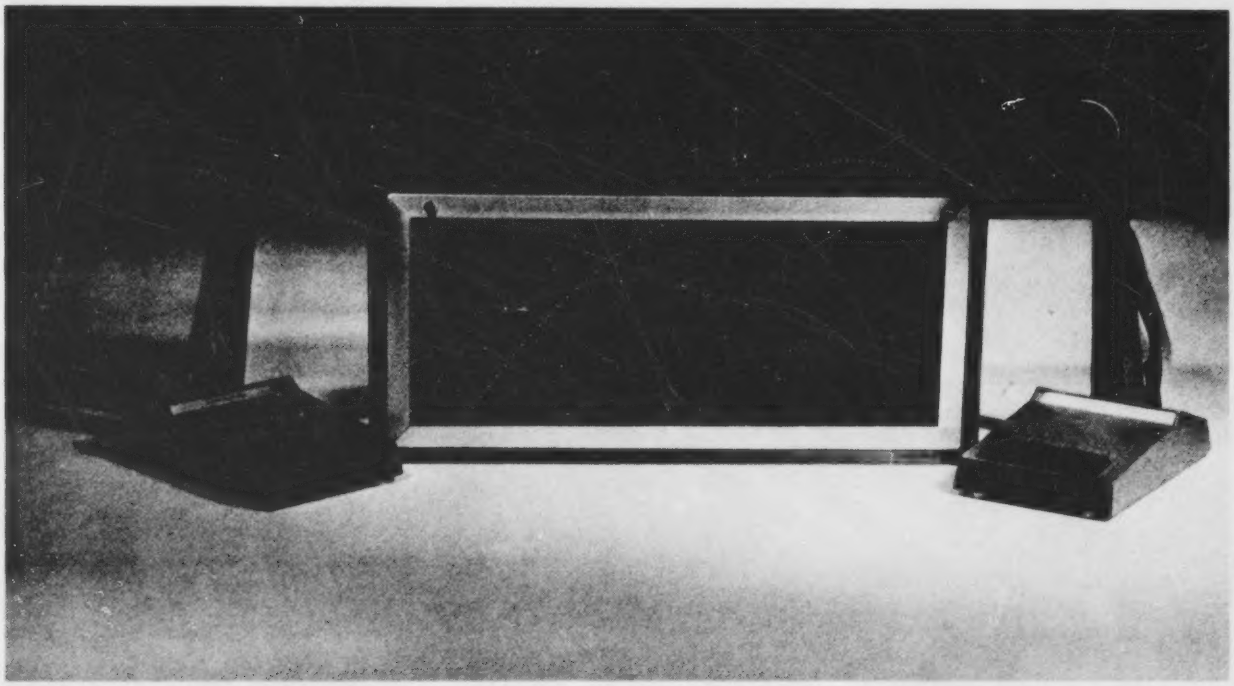
The POTS station equipment, the Darome Model 610, evolved from technical requirements substantially different than those governing the ETN station equipment. Portability was a primary consideration. ICS ships the unit, via common carrier, to an off-campus location for origination of an ETN program. At times, the equipment is hand carried on commercial aircraft. The Model 680 carrying case, which can fit under a commercial aircraft coach seat, houses the Model 610 convener, its basic 491 microphone and up to three additional Model 461 microphones.

Fundamentally, the 610 converts to a common 2-wire telephone circuit, rather than a 4-wire private circuit. Internally, the station receive channel and station transmit channel are very similar to their 4-wire counterparts. That is, the receive channel has a filter, preamplifier and 14 watt audio amplifier. Level adjustment is made by a single control. Transmission to ETN is with the same high quality press-to-activate cardioid microphone used with the Model 604. The difference lies in the switching. A voice operated switching circuit determines whether the station transmit or receive channel is connected to the phone line. In the quiescent mode both are off, and the channel on status is decided on a first come first serve basis.

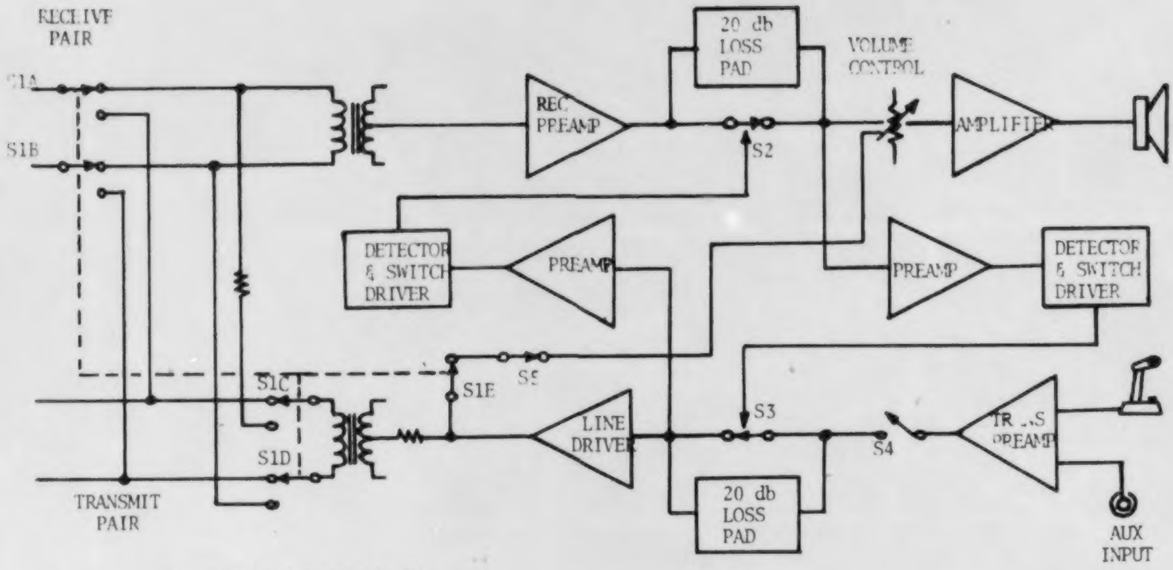
The Model 610 is operated in conjunction with a standard telephone, which is used to dial outgoing calls and provide a ringer for incoming calls. Transfer to the convener is made by a switch on the Model 491 microphone. A Light Emitting Diode (LED) provides an "on line" status indication. A short for the telephone line control leads is provided for telephone facilities with the hold circuit requirements. As with the Model 604, the addition of a Model 603 mixer allows the use of more microphones.

Design Constraints

In designing the ETN station equipment several noise constraints had to be considered; these can be broken into two categories, acoustic and electrical



MODEL 610



S1 - LOOPBACK TEST SWITCH
S2,3,4 - SOLID STATE SWITCHES

FUNCTIONAL BLOCK DIAGRAM - MODEL 604 CONVENER

noise. Acoustic problems are related to the classroom size, the number of students in the classroom, the acoustical characteristics of the room, and the number of classrooms that are going to be tied together on the common network.

The classrooms used on the Educational Telephone Network vary in size from rooms seating 20 students to those seating 300, and sufficient acoustic power must be available to provide an intelligible sound level to any of these classrooms. A 14 watt RMS amplifier was deemed adequate, while three 5 1/2 inch speakers provide the sound projection. Additional speaker jacks on the basic unit facilitate adding column speakers to insure proper sound coverage in acoustically difficult rooms.

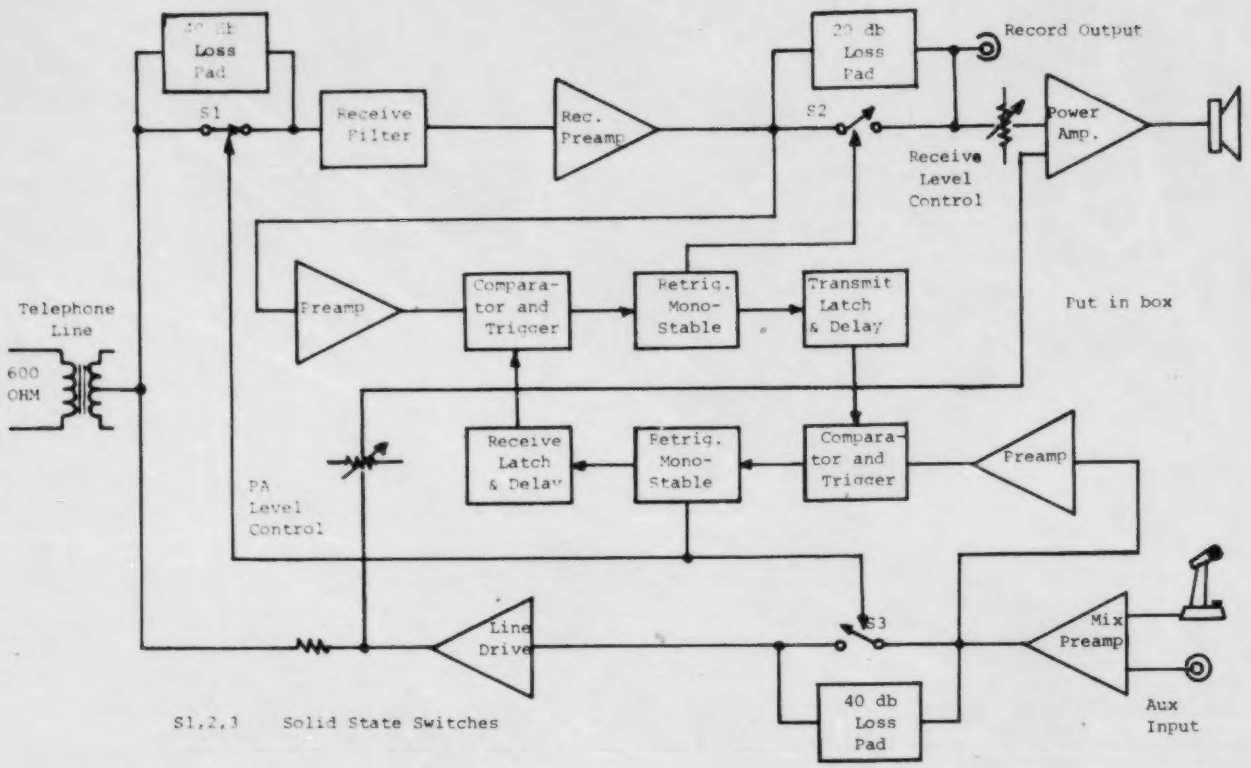
Classroom noise from numerous locations combining simultaneously on ETN would render the network useless for viable communications, therefore unused microphones in the classrooms are kept off to eliminate normal room noises. A voice-activated microphone was not chosen for this application simply because the noise to be eliminated would turn on the voice gate and pass the unwanted noise to the network. The microphone used with the Model 604 is a desk top mic with a built-in press-to-activate switch which requires minimum effort on the part of the student to initiate a question or response. (It was generally agreed that this would not significantly inhibit student response.)

The primary electrical noise constraint is the inherent noise generated by electronic devices, commonly referred to as "white noise." Again, with 200 such conference units tied on a common additive circuit, the amount of white noise would prohibit any intelligible communication. Since the student is required to press the drawbar on a microphone to speak, a solid state switch was added to shut-off the transmit circuit. This electronic switch, S4, was installed in such a way that the transmit circuit retains a proper termination of the phone line while prohibiting any electronic white noise from being transmitted to the telephone network. When the student presses the switch to speak, he activates both the microphone and the transmit circuit.

The noise constraints on the POTS station equipment are similar to those of the ETN model. Because of the generally smaller room sizes as well as the convener's smaller physical size, the Model 610 has one speaker rather than three. Acoustic output power is adequate for medium-sized meeting rooms.

For 2-wire, the voice activation, which was viewed as a disadvantage on the Model 604, is necessary to perform the transmit/receive switching on the Model 610. However, each microphone is disconnected from the transmit preamplifier until the drawbar is pressed. Once the microphone is connected, the voice switch (S3) operates when the input signal is of sufficient amplitude. Having the transmit in a normal off mode, again prevents the electronic white noise from adding to the network noise level.

The second category of restraints governing the design of the convener encompasses those affecting the signal-to-noise ratio. This ratio reflects the amount of signal present to the amount of noise present on the network at a given point and time. Conversely, with a given amount of noise on the network, a certain signal level must be maintained above that noise level to establish effective communications.


20 db
Loss
Pad
S1
Receive
Filter
Rec.
Preamp
20 db
Loss
Pad
Record Output
S2
Power
Amp.
Receive
Level
Control
Telephone
Line
600
OHM
Preamp
Compara-
tor and
Trigger
Retrig.
Mono-
Stable
Transmit
Latch
& Delay
Put in box
PA
Level
Control
Receive
Latch
& Delay
Retrig.
Mono-
Stable
Compara-
tor and
Trigger
Preamp
S3
Line
Driver
Mix
Preamp
40 db
Loss
Pad
Aux
Input
S1,2,3 Solid State Switches

FUNCTIONAL BLOCK DIAGRAM - MODEL 610 CONVENER

Technical constraints to achieve a good signal-to-noise ratio involve all the elements in a sound reinforcement system, their location and relative locations within the room and the room acoustics. The room acoustics have to be accepted for two reasons. In many cases the classroom facilities are not under the control the University, such as those in hospitals, court houses and municipal libraries. The second reason is financial. The cost of acoustic treatment for 200 classrooms would be prohibitive.

The elements of the sound system include the microphone, amplifier and speaker. These elements must be optimized to eliminate two acoustic problems, commonly referred to as "echo" and "barrel effect." To the person at a network location listening to another person speaking from a second location, the listener experiences the illusion that the talker is at the bottom of a barrel.

This problem is aggrevated by live rooms. The live room has an abnormally high content of reflected sound because there are insufficient absorbtive surfaces to dissipate the acoustic energy. Consequently, the sound energy decays slowly, or the room is said to have a long reverberation time. The incident or direct sound is transmitted followed by transmissions of the reflected sound. The reflected sound is delayed from the incident sound and thus creates the barrel effect.

Basically, the barrel effect occurs in two situations. First, when the transmit preamplifier gain is increased so the speaker can be picked up across the room from the microphone. With the gain that high, the incident and reflected sounds will be transmitted creating the problem. The second occurs when the public address level is set too high. The talker's incident sound is picked up by the microphone and amplified to such a level that the reverberant sound from the sound system becomes significant relative to the talker's incident sound.

Minimizing these problems begins with selecting a highly directional cardioid microphone. The cardioid microphone responds well to signals directly on the front axis of the microphone and the response drops off sharply on the sides and rear of the microphone.

A second step towards a workable solution is to fix the transmit preamplifier gain. The fixed gain requires that the talker be within 12 to 18 inches of the front of the microphone to transmit an acceptable signal level. This eliminates the first cause of the barrel effect mentioned above. A benefit of this restriction is minimizing the transmission of room noises during the time a talker's microphone is on. To the remote network listener, the talker's voice is heard at a considerably higher level than the background noise within the room. Consequently, a good signal-to-noise ratio exists. In addition to limiting the transmit gain, the frequency response of the transmit preamplifier is tailored for speech intelligibility and telephone line compatibility.

To eliminate the second cause of the barrel effect, the public address level was fixed in relation to the receive level. As the receive is adjusted for a comfortable listening level, the public address level is generally maintained below the level at which the barrel effect begins. As a backup measure, a defeat switch eliminates the entire public address signal in an otherwise impossible acoustic situation.

The second acoustic problem to be eliminated is "echo," a common problem in telephone circuits. Echo is that portion of a transmitted signal which is retransmitted by the receiving end of the signal path. Generally, this signal is delayed in time by the transmission path. On ETN, echo occurs when a signal is received, amplified in the classroom, and transmitted back through ETN by an open microphone. Electronic delay is encountered in the telephone network and acoustic delay is encountered in the classroom. This echo is eliminated with the Model 604 by inserting 40 db of loss in each loop which is a potential source of echo, 20 db of loss in the talker's receive channel, and 20 db in the listener's transmit channel.

This is accomplished in the Darome Model 604 convener by the addition of voice operated switches S2 and S3. The switching operates as follows: with the microphone switch depressed and signal present on the microphone and transmit channel, a portion of the signal is fed to a preamplifier which in turn attenuates the receive channel by 20 db, that is, S2 opens. The figure of 20 db was arrived at by considering the number of stations involved, a typical number of microphones that might be in operation at any given time, and the amount of delay expected. This 20 db loss in the receive channel inhibits network signals from being amplified in the room and retransmitted on an open microphone. To further understand the operation, consider a unit at a station where the transmitted signal is received, that is, a listener's location. The listener's channel has a signal sensor on its input. With a signal present on the receive channel, the transmit channel is inhibited by 20 db (S3 opens) in the same way the receive channel is inhibited at the station where the signal is transmitted. In other words, if a student in a listening room were to press his microphone and attempt to speak with a signal present on his receive channel, he would be inhibited by 20 db.

Maintaining the signal-to-noise ratio on the POTS station equipment requires similar precautions, since the constraints are similar. That is, maintaining a sound reinforcement system in typically live rooms and obtaining a good transmit signal level. The transmit signal is picked up by the same cardioid microphone and amplified by a fixed gain preamplifier. The preamplifier response is tailored for speech.

The public address level is adjusted by a screwdriver control which is relatively inaccessible. The PA level is unaffected by the receive level control. Thus, the PA level can be set, and the sound system checked for stability prior to connection to the telephone facility. The wider signal level variations encountered on the DDD network dictate this control mechanization.

Echo on the POTS station equipment is eliminated by the simplex operation. The Model 610 is either in the transmit or receive mode, and therefore, cannot retransmit a station receive signal.

The simplex operation offers one signal-to-noise advantage. With the receive normally off (S2 open), telephone line noise below the gain threshold is not heard. The distraction of normal telephone line crosstalk is minimized since it can only be heard in the presence of a signal with sufficient amplitude to operate the voice switch. Therefore, the listener is not able to focus his attention on the background noise.

Maintenance

From the viewpoint of maintenance, the major constraint is the number of ETN units and their statewide distribution. The first question which arises after a station outage is, what has failed, the telephone line facility or the conference unit itself? The solution implemented in the design was to incorporate a loopback test feature. With the unit plugged into an ETN outlet, the loopback switch (S1) is placed in the test position. This switch ties the telephone line's transmit pair to its receive pair and internally disconnects the unit from the telephone line. A telephone company technician can then determine if the line is operational from the central office without dispatching service personnel to the classroom site.

As a second step, the conference unit itself can be tested. Activating the same loopback test switch also shorts the unit's transmit pair to its receive pair. By turning the receive to maximum volume and talking into a microphone, a signal is transmitted and received by the same unit. While the audio is distorted by the gating, it does verify the unit's operational integrity.

Maintenance on the conference unit itself is minimized by having all the internal electronic components on one plug-in printed circuit board. The customer's service department can replace the defective board with a spare and return the defective board to the manufacturer for repair. The university also has the option of replacing the entire defective unit.

Another potential source of maintenance on equipment is the operational complexity. The Model 604 controls have been minimized. There is no AC on/off switch; an LED indicates that the unit is plugged in and has power coming to it. A single control operates the station receive and public address levels. A PA on/off switch (S5) is provided, but is relatively inaccessible once the convener is set up.

A loopback test switch was mentioned above. The switch chosen was a spring return slide switch. This provides a simple operator presentation and maintains the unit in its normal mode of operation.

The POTS station equipment is a completely solid state design with integrated circuits for the majority of the circuit functions. For maintenance and test reasons, the circuitry is contained on a single plug-in printed circuit board. G 10 glass epoxy printed circuit material was chosen for strength against the abuse that portable equipment must endure.

A LED indicates when the Model 610 is actually on the telephone line. The unit left on is equivalent to an "off hook" condition on a normal telephone. The indicator serves as a reminder to turn the unit off after the completion of the conference.

Again, the controls were kept to a minimum; a receive control and screwdriver adjustment for public address level. Only one microphone is equipped with a switch to answer the phone line, but all microphone jacks are the same, allowing this special microphone to be plugged into any of the four chassis jacks.

The Future of Teleconferencing Station Equipment

The requirements of ETN at the University of Wisconsin-Extension provided the stimulus for the design of new teleconferencing equipment. These requirements are not unique to a university's continuing education program; they apply to any institution or business which has a frequent need to communicate with groups of geographically dispersed individuals.

The United States Army is one example. From 25 regular Army schools with technical specialties, information and training must be provided to hundreds of regular Army bases and thousands of Army Reserve Centers. Numerous companies have sales offices throughout the states and around the world. Training and management efforts using teleconferencing could economically replace a significant percentage of the personal contact which occurs in these companies.

To enhance the use of teleconferencing, Darome developed other conveners which utilize slides as a visual aid. An instructor at one location can make a presentation over a conference network with each location having a slide projector and a duplicate set of slides. The instructor can then move all slide projectors forward and backward at his discretion.

Other improvements to existing Darome equipment which are in various stages of completion include the following:

--Built-in telephone line protection and repeat coils. Regulations governing the interconnection of customer-owned equipment to the telephone network have been challenged in recent years. As these regulations change and permit direct connection to the network, the inclusion of the protective devices will be mandatory.

--Adding built-in dial and ringer on the POTS station equipment. This would eliminate the need for a telephone, thereby simplifying the setup time and operation.

Areas of improvement under design investigation include the following:

--Smaller microphones. For portable equipment, the weight and size advantage would be substantial. For a Model 610 convener, the microphones and cords require twice the storage space occupied by the basic unit.

--Noise Mitigating Transmit Techniques. Noise on a telephone circuit not only detracts from the conference intelligibility, but also creates annoying gating problems. This is particularly evident on the POTS station equipment. Improvements in overall noise levels, while using standard telephone circuits, will certainly extend the use of teleconferencing throughout business and education.

--2-wire POTS station equipment which more closely resembles duplex operation. The present simplex operation of, say the Model 610, requires some discipline on the part of the conference participants. A more conversational unit would meet less opposition in marketplace.

All of the above would improve the state of the art in teleconferencing. However, substantial increases in the usage of teleconferencing will occur as it becomes as easy to use as the telephone itself. This means having customer operated conferencing equipment. Whether the conferencing bridge is on the customer's premise or is part of the telephone company central office should make little difference. The important feature will be to have the equipment available for use at the customer's option. Placing repeated conference calls could be done by a programmable dialer. The dialer could store the group of telephone numbers and originate the calls on demand or on a predetermined schedule.

The setup of the station equipment for short term usage could be greatly simplified by wireless microphones. The ability to pass microphones around the classroom or meeting room would facilitate more extensive participation. Other benefits which would occur are size and weight of the equipment.

Another development for the future is an individual student-type convener. The unit could be assigned to the student at the time of enrollment for a particular course.

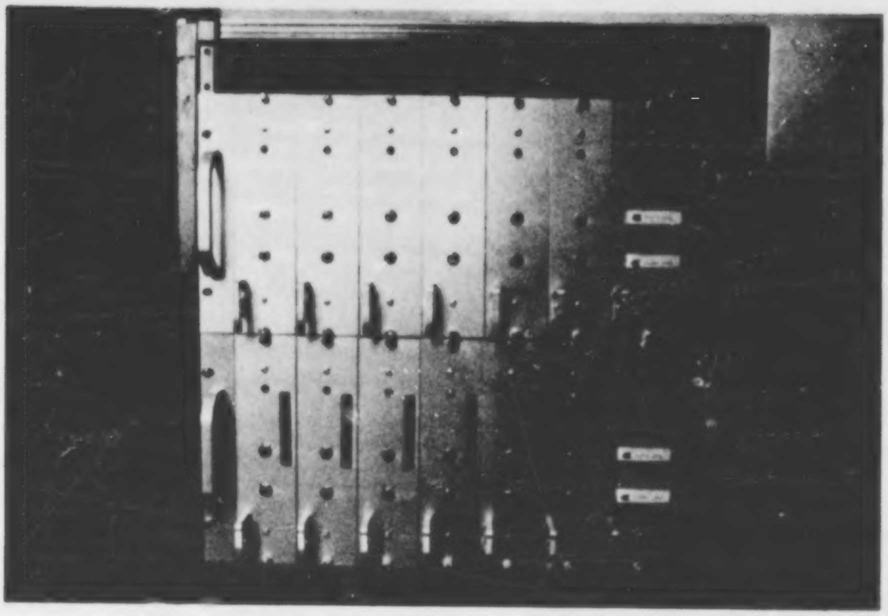
For permanent installations in the "board room" category, a more sophisticated system is required. A modular, tabletop system which includes all microphones and speakers would circumvent an expensive custom installation. At the same time, it could provide a very usable teleconferencing system.

The telephone network is a natural teleconferencing vehicle. As special segments of educational requirements expand, a satellite could be used for nationwide programs. Closed circuit television could provide a mass medium for education. The student could not only obtain the video presentation, but through the use of an adapter, enter into two-way discussions with the instructor and other students.

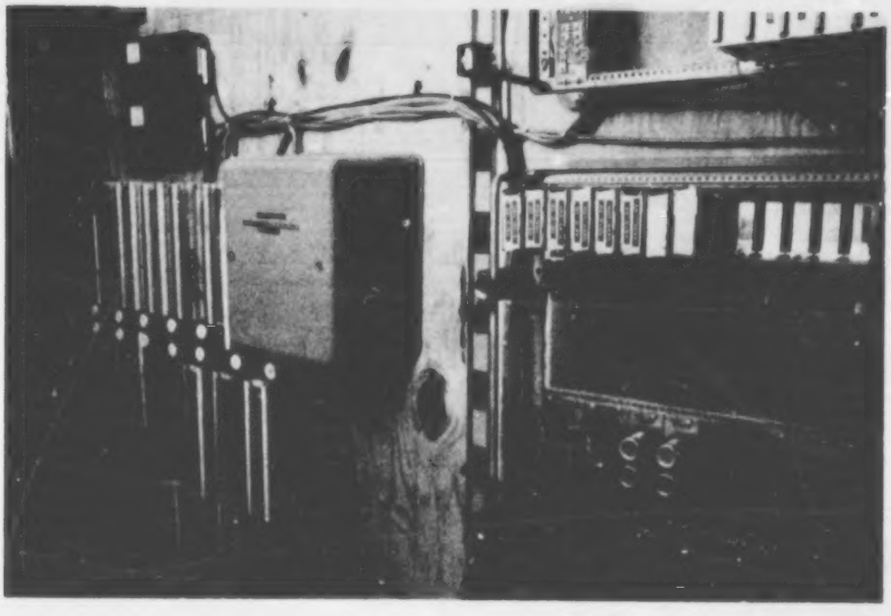
The Distribution Network

The distribution network for ETN is leased from the Wisconsin Telephone Company. The network is provided as a private line talk, multipoint service. With the exception of the ICS studio control facility, the equipment, facilities, station terminations and portable station equipment are furnished by the Telephone Industry of the State of Wisconsin. The Wisconsin Telephone Company furnishes most of the backbone facilities as well as bridging and test locations. The Independent Telephone Companies furnish some of the facilities, such as bridging and station terminations. Portable station terminations are provided jointly by the Wisconsin Telephone Company and the General Telephone Company of Wisconsin. Many people and companies are involved in a coordinated effort by the Telephone Industry to provide a uniform grade of service throughout the State of Wisconsin.

The Wisconsin Telephone Company coordinated the design and installation of the ETN. Uniform equipment



DAROME CONVENER SWITCHED GAIN REPEATER PACKAGE



TELEPHONE COMPANY EQUIPMENT ROOM IN OLD RADIO HALL

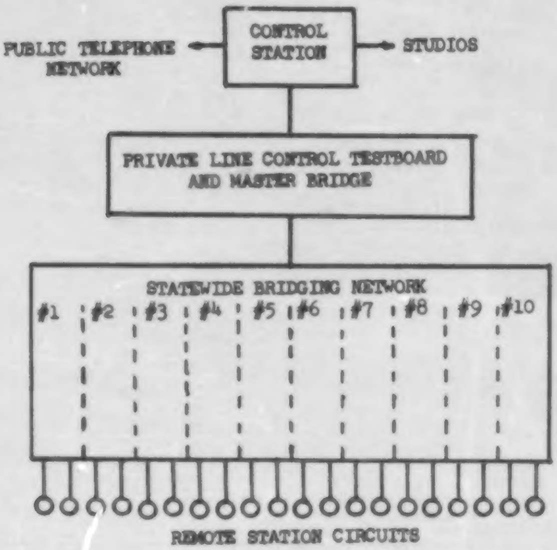
69

and facility specifications were agreed upon and standard station installation procedures were specified in detail. Taking these facts into consideration, this description of the network will not include the many junctions of ownership of facilities and variations of equipment due to ownership.

To start the description of the distribution network, consider the block diagram in Figure I as identifying the major elements.

FIGURE 1

BLOCK DIAGRAM OF MAJOR ELEMENTS OF ETN DISTRIBUTION NETWORK


PUBLIC TELEPHONE NETWORK
CONTROL STATION
STUDIOS
PRIVATE LINE CONTROL TESTBOARD AND MASTER BRIDGE
STATEWIDE BRIDGING NETWORK
#1
#2
#3
#4
#5
#6
#7
#8
#9
#10
REMOTE STATION CIRCUITS

Each major element along with its component parts will be described separately. The interconnection of the elements into a system will be described by identifying the interface between elements.

The Control Station

The control station is quite complex. The ICS concept of network administration and control dictates this complexity. Major components of the control station, identified in Figure 2, can best be described individually.

The Control Bridge

The heart of the control station is the 4-wire 6-way resistive bridge (Wescom 416). This bridge combines the three major inputs into a unified line feed for the ETN: the ICS studio control input is combined with the Public Telephone Network input and the input from remote studios or other networks. The output of the control station bridge feeds a line driving repeater.

Each control bridge input is equipped with a Darome Convener switched gain repeater package (Figure 3), which is specially constructed for 19 inch relay rack mounting. This switched gain repeater provides the electrical equivalent of the portable remote station package. Each input to ETN, thereby, has the same switched gain characteristic.

The Public Telephone Network Bridge

The "Public Telephone Network Bridge" makes stations served by POTS available for interconnection to the ETN. Again the bridge used for this service is the 4-wire 6-way resistive bridge (Wescom 416). Each telephone line feeding the bridge is specially constructed to provide a 4-wire interface to the bridge. In addition the 4-wire design is extended to the serving telephone company central office switching machine.

FIGURE 2

CONTROL STATION OF ETN DISTRIBUTION NETWORK

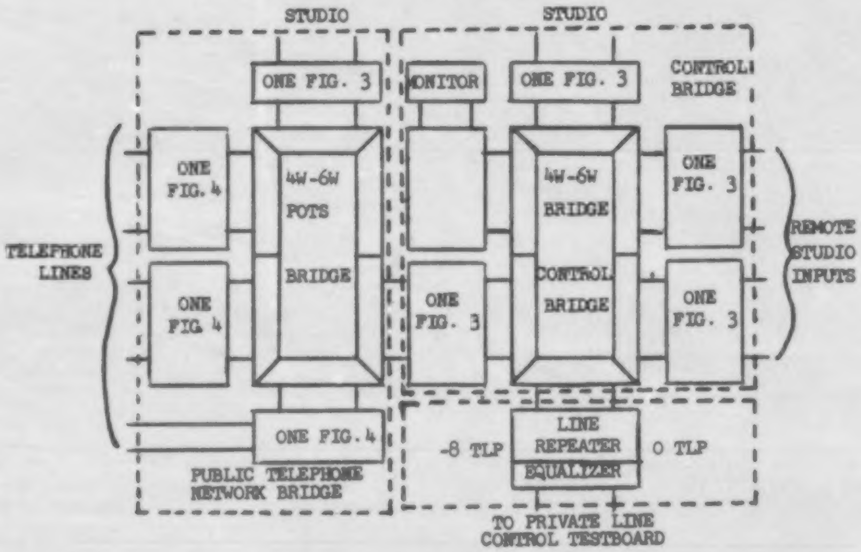
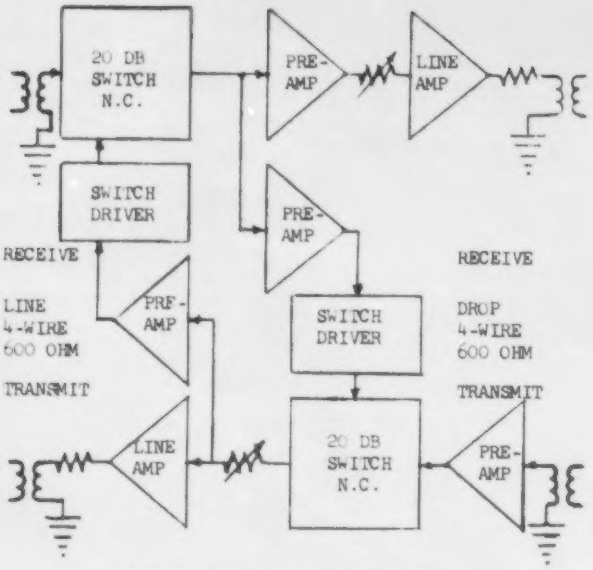

STUDIO
STUDIO
ONE FIG. 3
MONITOR
ONE FIG. 3
CONTROL BRIDGE
ONE FIG. 4
4W-6W POTS BRIDGE
4W-6W BRIDGE
CONTROL BRIDGE
ONE FIG. 3
TELEPHONE LINES
ONE FIG 4
ONE FIG. 3
ONE FIG. 3
REMOTE STUDIO INPUTS
ONE FIG. 4
-8 TLP
LINE REPEATER
EQUALIZER
0 TLP
PUBLIC TELEPHONE NETWORK BRIDGE
TO PRIVATE LINE CONTROL TESTBOARD

FIGURE 3


20 DB SWITCH N.C.
PRE-AMP
LINE AMP
SWITCH DRIVER
PRE-AMP
RECEIVE
RECEIVE
LINE 4-WIRE 600 OHM
PRF-AMP
SWITCH DRIVER
DROP 4-WIRE 600 OHM
TRANSMIT
TRANSMIT
LINE AMP
20 DB SWITCH N.C.
PRE-AMP

VOICE CROSS GATED REPEATER EQUIVALENT
TO DAROME 604 CONVENER - 4-WIRE

At the 2-wire interface with the switching machine, each telephone line is equipped with a 24-type repeater. The central office transmit leg of each repeater is equipped with a low pass filter and a compression amplifier.

The filter serves to limit conditions which would create singing or echo at the 2-wire junction with POTS service. The compression amplifier serves as a level control gate for all signals entering ETN from the Public Telephone Network. Using the signal level from an intertoll telephone call as a reference, the amplifier provides full amplification to signals at or below this level range. Input signals that are higher in level are soft limited by the feedback circuitry of the amplifier.

The deviation of peak input signal levels from the reference level selected was observed to be -3 db to +10 db. The deviation of output signal levels for the same observed sample was -3 db to +3 db. This range appears satisfactory for interconnection to the private line network. Since the signals being limited generally have a high signal-to-noise ratio, little noticeable signal to noise ratio degradation may be attributed to the compression amplifiers. Conditioned in this manner, a program from the public telephone network is compatible with the private line characteristics and program of ETN.

The Line Repeater

The line drive repeater connects the control bridge to the local cable pairs feeding the Plant Control Testboard. In so doing it sets the transmit

FIGURE 5

COMPRESSION AMPLIFIER OUTPUT SIGNAL
LEVEL DEVIATION AS A FUNCTION OF
INPUT SIGNAL LEVEL DEVIATION

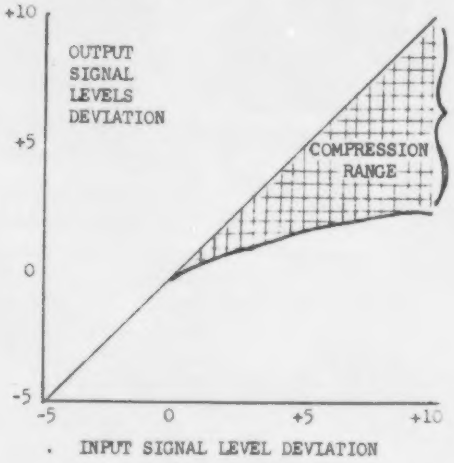
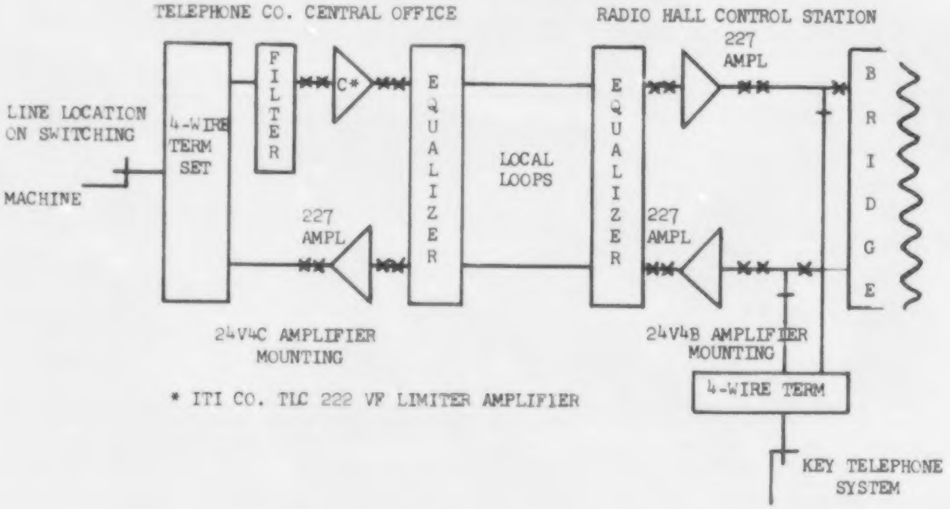


FIGURE 4

4-WIRE BRIDGE TELEPHONE LINE


TELEPHONE CO. CENTRAL OFFICE
RADIO HALL CONTROL STATION
LINE LOCATION ON SWITCHING MACHINE
4-WIRE TERM SET
FILTER
C*
EQUALIZER
LOCAL LOOPS
EQUALIZER
227 AMPL
BRIDGE
227 AMPL
227 AMPL
24V4C AMPLIFIER MOUNTING
24V4B AMPLIFIER MOUNTING
4-WIRE TERM
KEY TELEPHONE SYSTEM

* ITI CO. TLC 222 VF LIMITER AMPLIFIER

level to the line at 0 db Transmission Level Point (TLP), and the receive level from the line at -8 db TLP. These line interface levels are also used at each remote station interface throughout the network. The limiting signal level at the line input is 0 VU.

Normally a telephone instrument oriented system design would use -16 db TLP receive level. This signal level causes the telephone instruments to deliver the correct amount of acoustic power to the ear. The design deviation to -8 db could be made because telephone instruments are not used on ETN. Zero dbm receive level was not used since this level would have required active amplifiers at remote stations. The change to -8 dbm provided added signal-to-noise ratio margin for ETN.

The final function of the line drive repeater is to provide line equalization to improve band pass characteristics of the cable pairs between the Private Line Testboard and the Control Station.

The Private Line Control Testboard and Master Bridge

For ETN, the domain of the Madison Private Line Control Testboard (PLCTB) includes all telephone industry provided equipment and facilities used on the network. This responsibility is shared with regional private line serving test centers. For the purpose of this description, only equipment and facilities terminating on the Madison Testboard and the master bridge will be considered.

The cable pairs connecting the control station to the Private Line Control Testboard are accessible at the testboard normal patch jacks. The drop side of these jacks feeds the master bridge of ETN through a line equalizer and repeater. The Master Bridge interconnects the control station through region control circuits to the ten regional distribution networks. This bridge does not connect directly to remote stations.

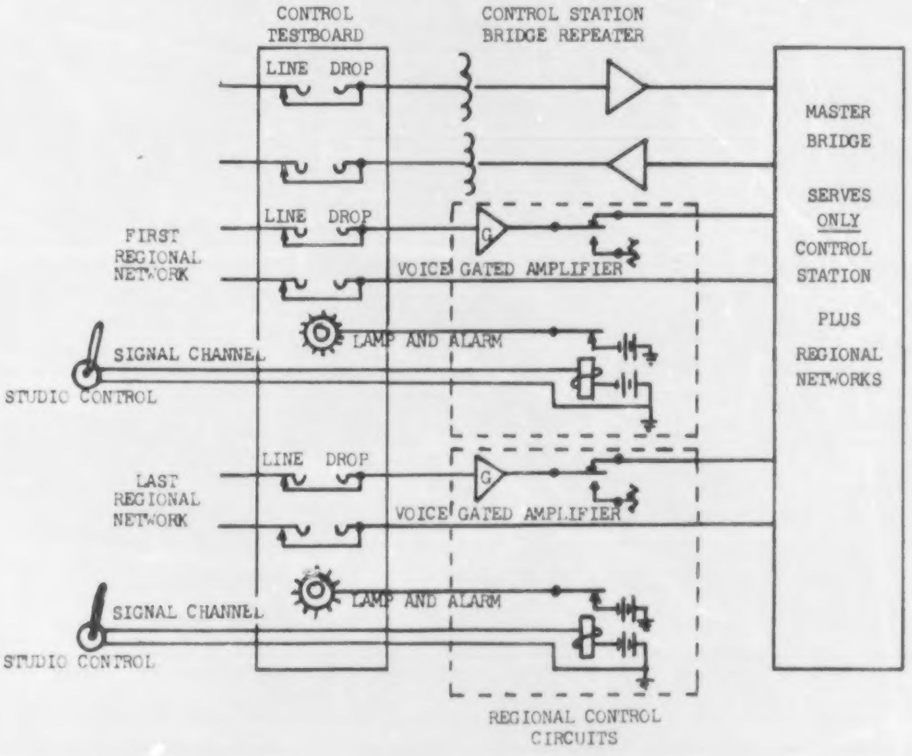
Each regional control circuit is connected by a signal channel to the Control Console at Studio Control for ETN. Each signal circuit operates a relay which 1) opens and terminates the receive signal path from the regional associated, and 2) signals the control testboard by operating a testboard lamp and alarm circuit. This function serves to isolate a regional master bridge receive port from the rest of ETN. (Trouble in one region does not affect other regions.) It also serves to report a regional trouble condition immediately to the PLCTB.

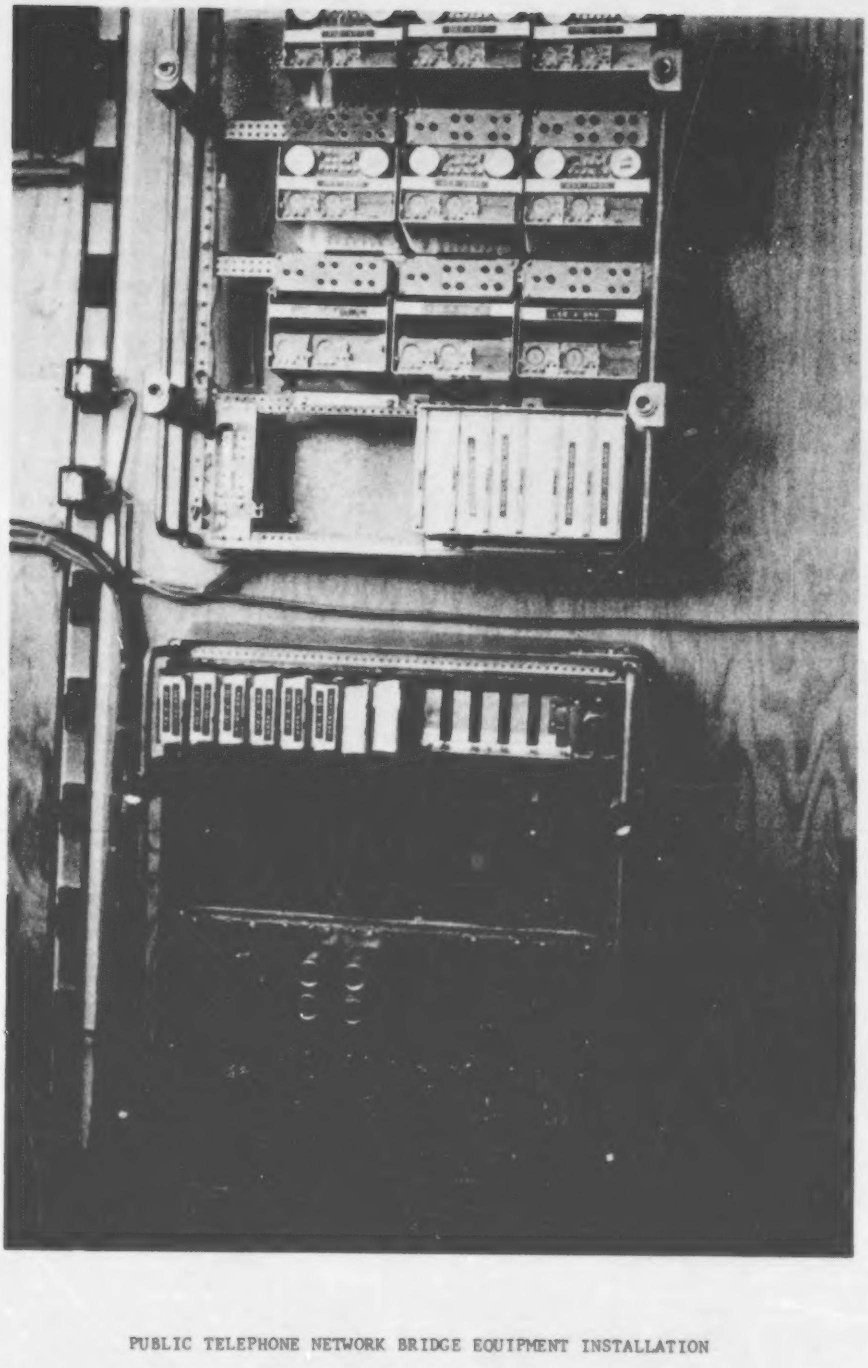
In its normal state the Master Bridge serves as a one-way distribution network passing program from the control station to each regional network. The voice-gated amplifier in each regional Master Bridge receive leg is blocking regional noise from the Master Bridge. This is the condition with all remote stations listening to program. In this state, ETN is a broadcast-only conference circuit.

When a remote station addresses the ETN, the associated regional voice-gated amplifier gate triggers, transmitting the signal to the Master Bridge

FIGURE 6

MASTER BRIDGE AND PRIVATE LINE CONTROL TESTBOARD





PUBLIC TELEPHONE NETWORK BRIDGE EQUIPMENT INSTALLATION and on to the other regions. All stations receive the signal emanating from the remote station. In this state, ETN is a two-way conference circuit.

In the same manner, if a carrier channel or cable pair within a region were to fail, the noise generated would also trigger the voice-gated amplifier. This would, in turn, disable the entire ETN. The Studio Control console, by operating one control circuit relay at a time, can isolate the offending region in seconds, thus restoring nine of ten regions to service. The control testboard then swings into action, alerted by the operated lamp and alarm circuit associated with the offending region. They immediately contact the regional serving testboard involved. Together they further isolate the regional problem to a Primary Bridge leg. The offending leg is isolated from the primary bridge. The region, less the offending stations, is restored to service within minutes of the failure. Normal trouble clearance procedures are then applied to the offending stations.

The control testboard also receives trouble reports directly from remote stations when they experience difficulty. All customer trouble reports are made directly to the Madison PLCTB by ETN users.

One additional tool serves the PLCTB. A monitor leg from the Master Bridge is terminated in a portable speaker at the board. This serves the testman by providing immediate access to monitor trouble on the network without interrupting programs in progress. It also serves as a quick test for early hour testboard coverage. Trouble indications that appeared during the uncovered night hours can be investigated before the first ETN program in the morning.

The Statewide Bridging Networks

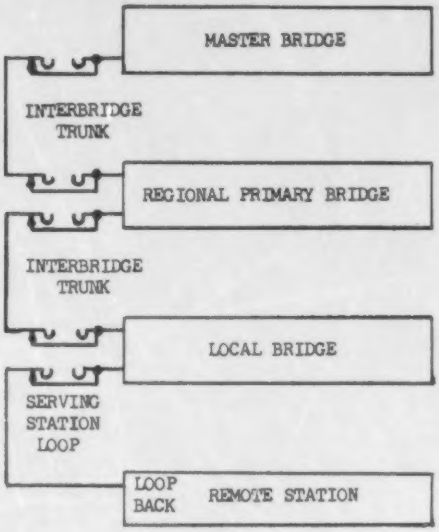
The practical size limit for multipoint private line telephone networks is twenty stations. The noise level, created by the multiple facilities and circuit equipment terminations connected together, is usually the limiting factor. ETN, with 200 ports, is able to provide service that satisfies users because the network is constructed from ten noise-isolated regions. Each region of the network serves 20 stations. Regions are isolated by the voice-gated amplifier at the Master Bridge regional receive port. The regional arrangement limits the noise level experienced at a remote station to noise generated by the facilities and terminations within a region.

When a remote station addresses the ETN, the voice-gate isolating its associated region from the Master Bridge opens. This allows the signal along with its accompanying noise level to enter the Master Bridge. The remote station signal and its accompanying regional network level is fed through to the other regional networks. The combining of this signal and noise with the steady state noise in the other regional networks raises the noise level in other regions. Under normal operating circumstances this is the highest noise level expected within a regional bridging network. (Equivalent noise to a station on a 40 port network for the period of conversation from remote station plus 100 milliseconds.)

Network Limits. Each region is served by one primary bridge which in turn serves remote stations either directly or through local bridges. The maximum number of tandem interbridge trunks within a region is two (Figure 7). On an interregional basis, this limits the number of tandem links in the transmission path between remote stations to four mid links (between bridges) and two end links.

FIGURE 7

TANDEM LINKS - MAXIMUM NUMBER FROM MASTER BRIDGE TO REMOTE STATION



Two point private line talk service is designed to meet an overall frequency attenuation distortion requirement as listed in Table 1. Multipoint service requires the same overall result. To attain this result each link is given a special consideration requirement also listed in Table 1. Each link is measured and maintained separately. Overall results are not measured for installation or maintenance purposes.

TABLE 1

PRIVATE LINE BANDWIDTH CIRCUIT ATTENUATION DISTORTION REQUIREMENTS (DB)*

FREQUENCY RANGE-HZ	OVERALL	MULTIPOINT	-4 MID LINK
	2-POINT	END LINK	MID LINK
500 - 2500	-2 to +8	-0.8 to +3.5	-0.8 to +3.0
300 - 3000	-3 to +12	-1.5 to +4.5	-1.0 to +4.5

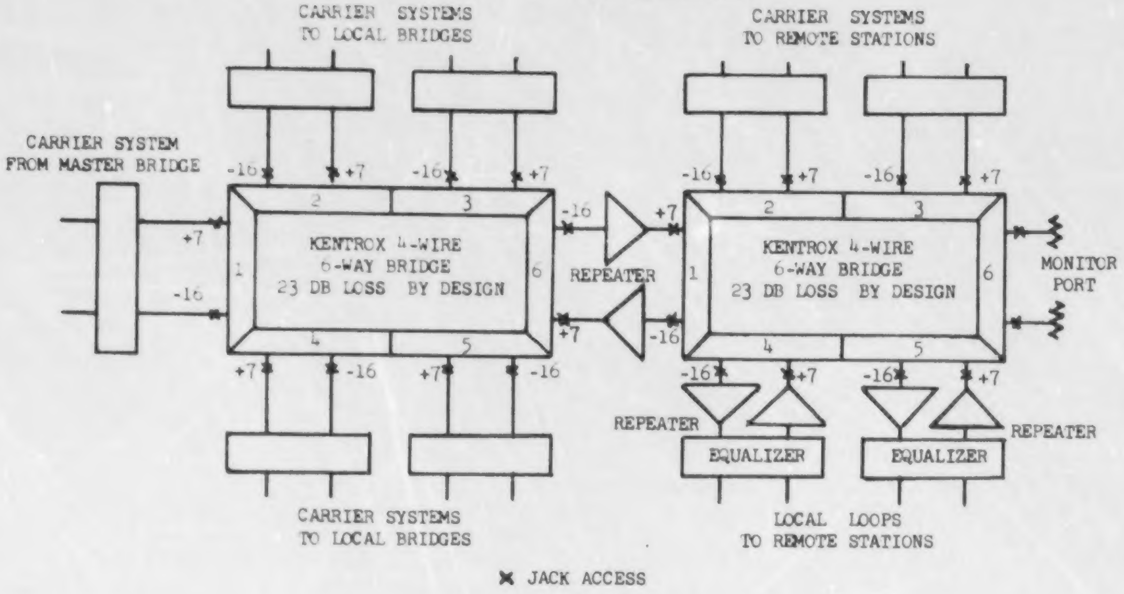
*DEVIATION FROM 1000 HZ LOSS
(-) LESS LOSS
(+) MORE LOSS

Network Equipment

The equipment used to provide the distributing network bridging arrangements consists of testboard normal jacks, 4-wire repeaters and Kentrox 4-wire - 6-way bridges. Carrier terminals are interconnected directly to the 46-type bridges which have 23 db of loss. The bridge serves in place of 23 db pads between interconnected carrier channels reducing wiring and equipment components necessary at bridging points. A typical regional bridge interconnection is

FIGURE 8

TYPICAL REGIONAL BRIDGE


CARRIER SYSTEMS TO LOCAL BRIDGES
CARRIER SYSTEMS TO REMOTE STATIONS
CARRIER SYSTEM FROM MASTER BRIDGE
KENTROX 4-WIRE 6-WAY BRIDGE 23 DB LOSS BY DESIGN
KENTROX 4-WIRE 6-WAY BRIDGE 23 DB LOSS BY DESIGN
1
2
3
4
5
6
+7
-16
REPEATER
MONITOR PORT
REPEATER
REPEATER
EQUALIZER
EQUALIZER
CARRIER SYSTEMS TO LOCAL BRIDGES
LOCAL LOOPS TO REMOTE STATIONS
✖ JACK ACCESS

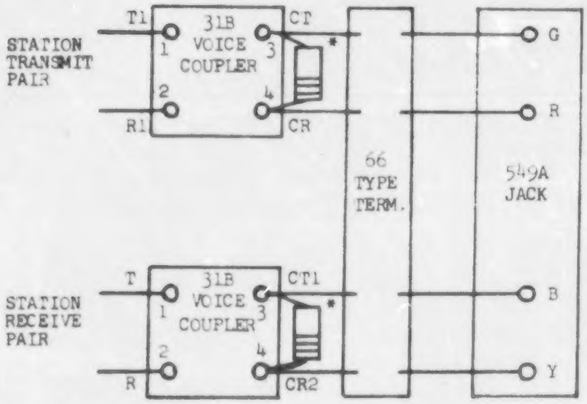
block diagramed in Figure 8.

The Remote Station Circuit

Each remote station is served from a regional, primary or local bridge. The facilities involved include interoffice cable or carrier, in addition to local loops. Circuit equipment is added to the station circuit to provide signal level treatment, as well as frequency attenuation and bandwidth equalization. The hand-wired station equipment provides a standard 4-wire termination and wiring to 4-wire telephone jacks.

FIGURE 9

REMOTE STATION HARD WIRED TERMINATING ARRANGEMENT

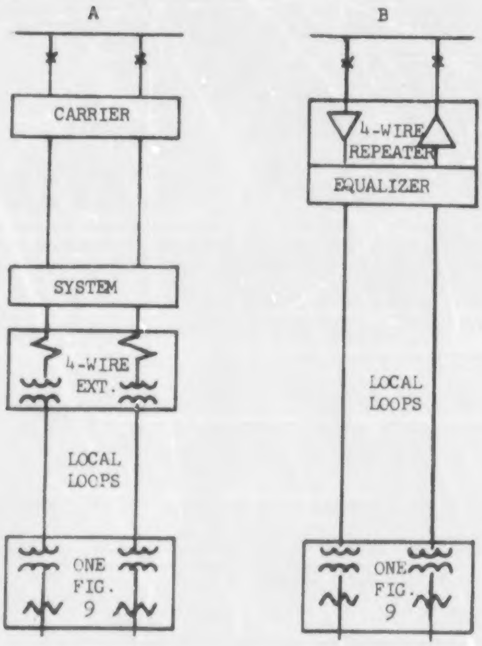

STATION TRANSMIT PAIR
T1
R1
31B VOICE COUPLER
1
2
3
4
CT
CR
*
STATION RECEIVE PAIR
T
R
31B VOICE COUPLER
CT1
CR2
66 TYPE TERM.
549A JACK
G
R
B
Y

*1500 OHM 1 WATT RESISTOR SERVES AS PARTIAL TERMINATION FOR STATION WHEN PORTABLE EQUIPMENT IS NOT CONNECTED TO JACKS.

The remote station circuit is of modular design. Two standard modules have been established. The first type is used when the serving bridge port location is other than the serving central office for the local loop to the station (Figure 10). The second type is used when the serving bridge port and the station loop terminations are in the same wire center or central office.

FIGURE 10

REMOTE STATION CIRCUIT MODULES


A
B
CARRIER
SYSTEM
4-WIRE EXT.
LOCAL LOOPS
ONE FIG. 9
4-WIRE REPEATER
EQUALIZER
LOCAL LOOPS
ONE FIG. 9

Using The Transmission System To Overcome Network Obstacles and Constraints

The difference between a mediocre transmission system and a superb transmission system is fine tuning. In the case of ETN, the transmission system appears ordinary enough, but there is evidence of fine tuning. Starting at the control station and proceeding through the system, fine tuning is accomplished by these specific details:

1. The unique blending of POTS and studio programming using the ITI limited amplifier to equalize signals levels.
2. The uniform switched-gain repeater characteristic of signal treatment for all network ports.
3. Optimizing the network line receive level to -8.0 db TLP.
4. The Master Bridge concept to combine regional networks.
5. The regional control circuits utilizing the ITI 1130 voice-gated amplifier to isolate regional noise level.
6. The relay switching within the regional control circuit for customer initiated maintenance action.
7. The two interbridge link network design for improved frequency attenuation performance as well as rapid trouble isolation. (Overall design is four links but studio to remote station is two links.)
8. Uniform bridging configuration and equipment to minimize design and maintenance practices.
9. Passive hard-wired station terminations.
10. Uniform station installation instructions for Wisconsin Telephone Company stations as well as Independent Telephone Company stations.
11. Uniform Testing instructions distributed with Special Service Work Order to each installer and testman.
12. One trouble report center for all stations on network.
13. Station loopback feature provided by portable station package to provide speed testing.
14. The usage of specialized equipment to hand tailor the network.
    - A) TLC 222 VF limited amplifier(a)
    - B) TLC 1130-1 voice-gated amplifier(a)
    - C) Kentrox 4-wire 6-way distributing frame mounted bridge with 23 db loss design.(b)
    - D) Darome switched gain repeater at each ETN station port.(c)

(a) ITI Electronics, Inc., 369
Levington Avenue, Clifton, N.J.
07015

(b) Kentrox Industries, Inc., 14335
N.W. Science Park Drive, Portland,
Oregon 97229

(c) Darome, 711 East Diggins Street,
Harvard, Illinois 60033

Since system design must be user sensitive, each of these fine-tuning features was introduced into the transmission system design as improvements were deemed necessary. As feedback from the user indicates a weak spot, a solution eliminating the weak spot is required. This network design is not constrained by hardware, Telephone Company, University, or even normal maintenance practices. History of growth has demonstrated ETN to be truly user sensitive. Each network improvement feature is instigated by user feedback.

Future Speculation

There is no time to be complacent in a system which plans to meet user requirements: Continuing feedback indicates that the user is always reaching to improve his lot. Where can the transmission system be improved to meet this challenge?

Improve Low Station Usage Time. The first apparent ETN weak spot is low individual station usage time. Although the network usage time is fully committed, there are many stations idle for any particular program. ETN could be more effective if small groups of stations could be switched into POTS bridging arrangements. These POTS bridges could then provide additional program capacity for the stations so connected. It is conceivable that regional POTS bridges would meet this need.

If a POTS bridge were established, it could be used in reverse to bridge POTS stations to ETN at Regional Bridges. This would provide programs to stations which are not now economical because of low usage. This bridging could be best accomplished on a meet-me basis of switching (remote station controls access to network).

Privacy Feature For Control of Stations Receiving Program. There is always the possibility that stations not contracting for a program could bootleg the program. This is the normal state of the network. Each station has access to the network at all times. A privacy feature, somewhat simplified from SS3 signaling system now offered for multipoint private line systems, could be developed to channelize ETN for major station groups, e.g., hospitals, libraries, court houses, University of Wisconsin-Extension Centers.

User Feedback Requirements. Future changes in this Telephone Industry provided transmission system will be dictated by the feedback from user surveys. At this point, it is difficult to predict the developments this feedback may require. Suffice it to say, every effort will be made to expand the educational opportunities offered through this combined University and Telephone Industry offering.

Studio Control Complex

The ETN studio origination and control complex at Old Radio Hall on the University of Wisconsin-Madison campus, is equipped to provide operational control of the network. Within the complex are studios from which instructors broadcast their programs, and the control room, which is manned by a trained engineering technician who handles all equipment and adjustments during each program.

The instructor has a minimum of technology to cope with. During his presentation, he need only speak into a microphone, and he can hear a comment or question from the network through a loudspeaker. Unlike a regular ETN station microphone, there is no push-to-activate switch. All controls are handled by a trained engineer.

The studios and control room include the necessary equipment for use by the operator to guarantee a smooth trouble free program. Because the operator runs all technical aspects of the program, the instructor is free to concentrate his efforts on his material and presentation. The operator's role can be illustrated most clearly by a description of the steps involved in setting up and operating a typical program.

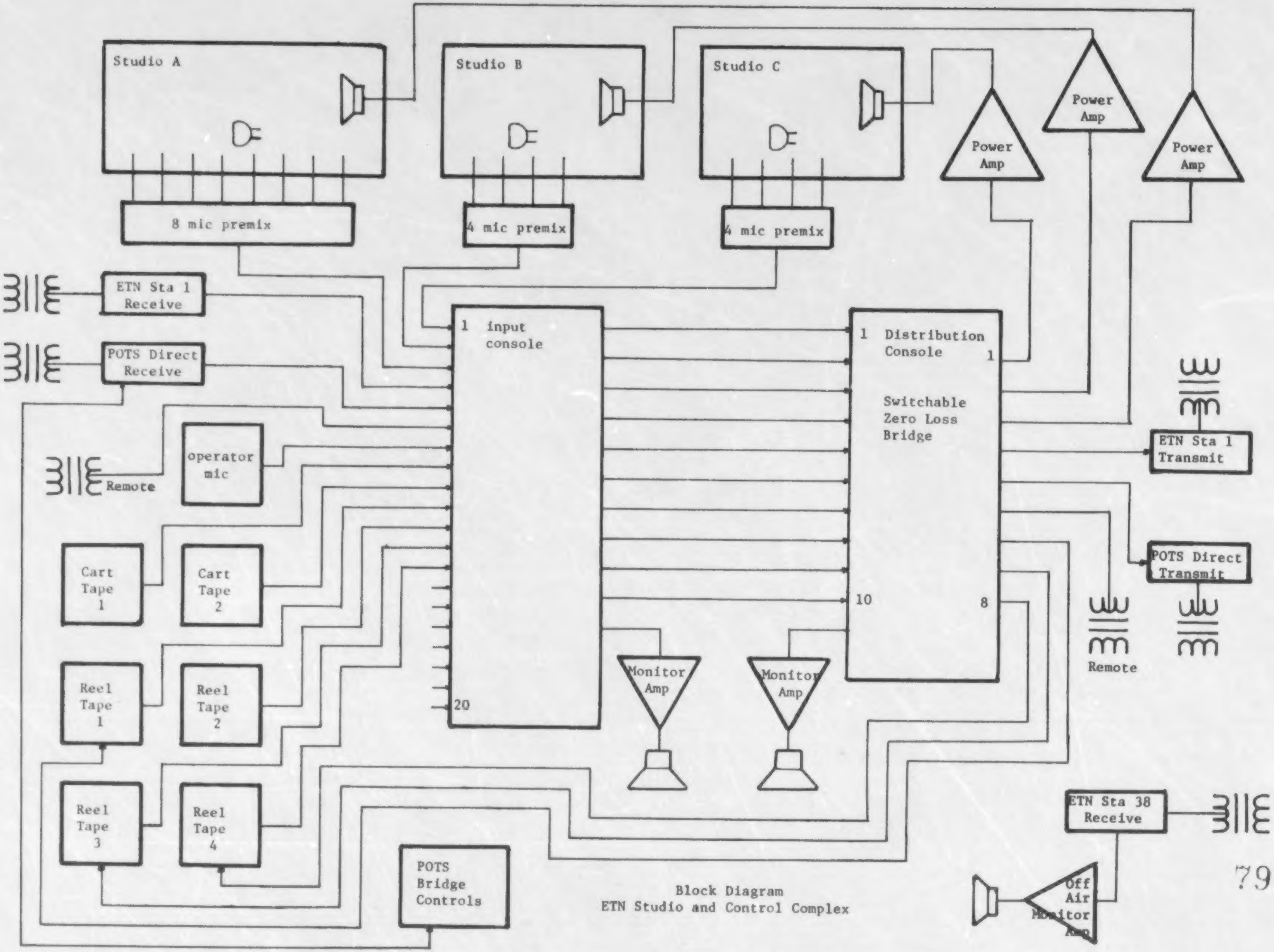
Before a program, the operator refers to a daily schedule and program format book, similar to a radio broadcast conformity sheet, which outlines the particular technical and operational requirements for that program. The studio is arranged with enough mics and chairs for participants, and, if slides or visuals are to be used, an appropriate projector and screen are set up. Insert tapes are loaded on tape machines and another tape machine is used to record the entire program.

The switches and controls on the input and distribution consoles are arranged in accordance with operational requirements. When the instructor arrives, the operator greets him and reviews the program format to check for any changes. If a participant is to be connected to ETN via POTS, the operator places the call, gets the party on the line and, when ready, connects him to ETN. A program introduction on cartridge tape is played, the studio microphones are turned on and the instructor begins.

During the program the operator plays the tape inserts on cue from the instructor. If a problem develops with the control room equipment, he quickly transfers to a back up unit. If he hears trouble on the network, such as noise, etc., he uses controls to isolate the offending region and reports it to the

ETN CONTROL ROOM

77


Studio A
Studio B
Studio C
8 mic premix
4 mic premix
4 mic premix
Power Amp
Power Amp
Power Amp
ETN Sta 1 Receive
POTS Direct Receive
Remote
operator mic
Cart Tape 1
Cart Tape 2
Reel Tape 1
Reel Tape 2
Reel Tape 3
Reel Tape 4
POTS Bridge Controls
1
input console
20
Monitor Amp
Monitor Amp
1
Distribution Console
1
Switchable Zero Loss Bridge
10
8
ETN Sta 1 Transmit
POTS Direct Transmit
Remote
ETN Sta 38 Receive
Off Air Monitor Amp

Block Diagram
ETN Studio and Control Complex

telephone test board which then helps to isolate and correct the problem. Most of the time problems do not occur, however the operator continuously monitors the program operation in case of trouble. When it does happen, all efforts are made to minimize the effect on the program.

The ETN control room is centrally located, with studios A, B and C adjoining on three sides. The operator and instructor have visual contact through large windows. The studios and control room are sound proof, and access to the rooms is provided through connecting doors and soundlocks.

Studios are furnished with conference style tables surrounded by comfortable padded swivel chairs. Studios B and C accommodate up to 8 people, while Studio A is much larger and can hold class sizes of about 40 students. Various table and chair arrangements are used depending on class size, although the smaller studios are generally left set up in the conference table arrangement.

The studios are treated to minimize reverberation and are essentially dead acoustically. Four high quality cardioid microphones give proper coverage in Studios B and C respectively, while up to eight are used in Studio A. In very large classes, no attempt is made to give a mic to each student. Generally, they share a single microphone provided at each table.

ETN ORIGINATION CENTER

The microphones are assigned to each studio and are terminated in a premix amplifier which is mounted in the control room. Here the operator can control the gain of each mic path. The outputs of the premix amplifiers are balanced line level and appear as an audio source at the input console.

Audio Tape Machine

Professional audio quality tape recorder/players are used in the ICS operation. Though the wide frequency response and low noise figures are not needed on ETN with its limited band width and inherent noise characteristics, they were chosen for other qualities: long term reliability, serviceability and ease of operation. Ampex AG350 has been in continuous use for ten years. Equipment includes four reel-to-reel machines and two broadcast-type cartridge machines which are employed to insert introductions, logos and other short segments used regularly in programs.

A standard tape-and-track format has been established. Seven inch reel tapes of either 1.5 mil or 1.0 mil A-V grade are recorded or played at either 3.75 or 7.5 ips 1/2 track mono. (Generally, 3.75 ips tape speed is used). Insert tapes are previewed and processed to adjust any deviations to these standards if needed. Maintaining these standards make it possible to quickly provide tape copies of the programs in either reel-to-reel or cassette, using high speed duplicating equipment. The output of the tape machines appears as audio sources at the input console.

The cassette format is used in the control room on occasions, generally as playback of an insert. Until recently cassette machines were not sufficiently reliable to be used for program mastering.

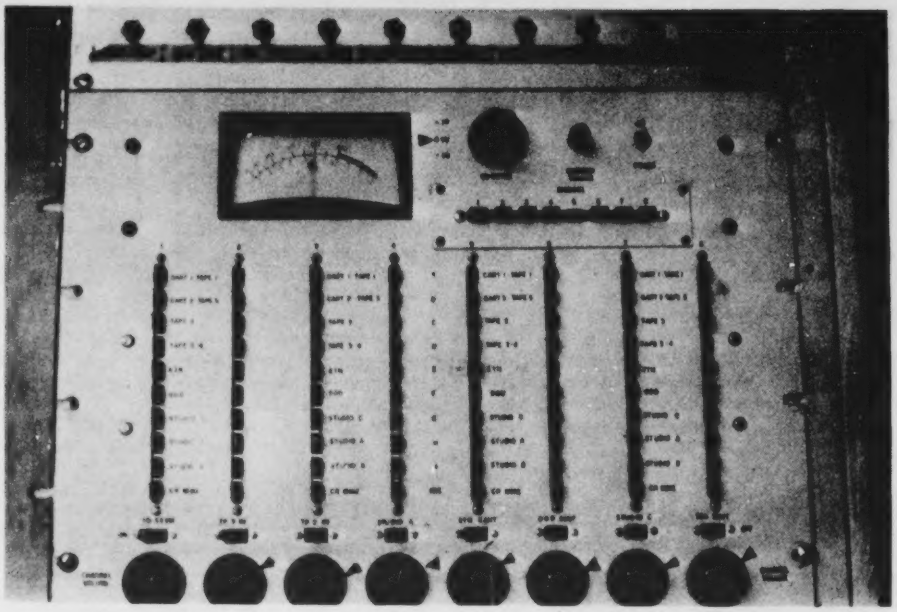
Other Audio Sources

A control room microphone allows the operator to talk to any point on the network. This mic can be used when assistance is required or if a trouble condition is to be cleared. Remote lines, provided to a number of services and class rooms outside Old Radio Hall, are used when programs originate from these points.

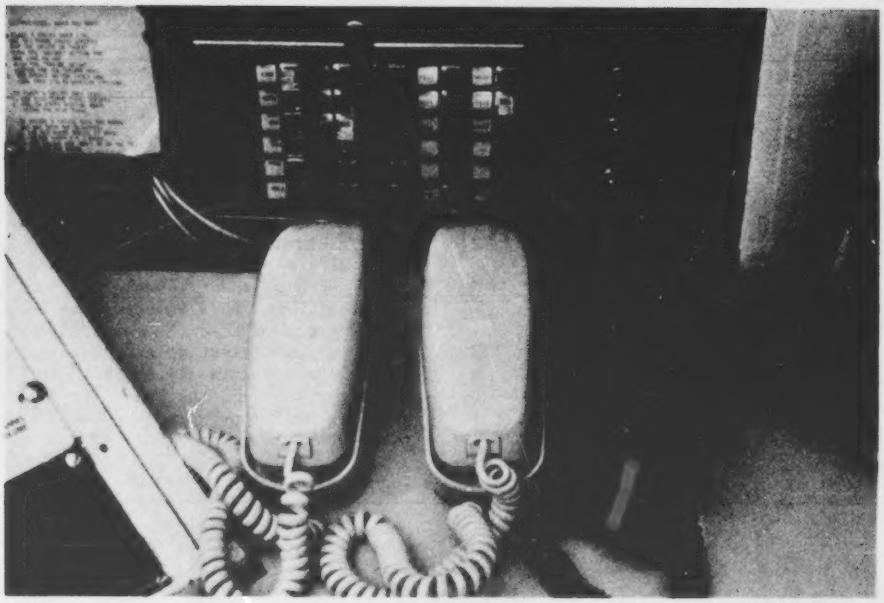
The ETN Station #1 receive port (the studio receive) appears in the control room and is the interface with the telephone company bridging equipment. The POTS bridging and conferencing features can be used independently of ETN when recording a program insert of a conference call with a studio group. This appears as the POTS (DDD) receive direct, and is an interface with telephone company provided equipment. These sources also appear at the input console.

Input Console

The input console, a modified radio broadcast control board, is used for a number of its basic features. It is the appearance point for all the audio sources. Input circuitry provides the necessary impedence matching and signal amplification or attenuation needed to properly terminate the varied audio source equipment. The console contains ten input channels with fader control of source levels and A or B source selector switch which doubles the sources readily available to twenty.



DISTRIBUTION CONSOLE



POTS BRIDGE CONTROLS

A program-audition select switch connects the audio source directly to the distribution console or to an audition monitor and amplifier and VU meter. This feature allows the operator to cue and listen to any of the audio sources without connecting them into the network or program.

Distribution Console

When a channel is switched to program at the input console, it is tied directly to its respective input at the distribution console. The distribution console is a switchable, zero loss bridge with ten inputs and eight outputs. Any combination of inputs can be tied to any combination of outputs. Isolation greater than 80 db is maintained between the inputs. Each of the outputs has a level control and on-off switch. The output amplifiers will drive a 600 ohm line to +14 dbm, enough power to meet most interface requirements. The outputs are tied to various points in the system and each feed point receives a combination of all other signals except its own new source. As an example, the speaker mounted in the studio is powered by an amplifier which is fed by one of the distribution console outputs. With the proper selection of source switching, the studio speaker receives all other signal sources, but not the signals from the studio microphones. This feature is needed to maintain the necessary 4-wire isolation integrity to be compatible with the ETN transmission system. Outputs are assigned to tape machines for recording, to ETN station #1 transmit to tie the studios to the rest of the network, to POTS direct and to other studio monitors.

Monitoring

Monitoring functions are an important tool for the control room operator. To successfully isolate trouble, he must be able to monitor the signals at each stage in the process.

In addition to the audition monitoring mentioned earlier, the operator is able to monitor any of the eight distribution console outputs. The program monitor amplifier and VU meter can be selectively switched to any of the outputs without loading or affecting it. Thus, if a low level report is received, the operator can check the outgoing level quickly and correct it if necessary.

Another monitoring feature is similar to a broadcast off-the-air monitor. A sample of the receive signal for ETN Station #38 is fed to a monitor amplifier speaker and a VU meter. Station #38 appears in Old Radio Hall. A proper signal appearing at this monitor point assures the control operator that Station #1 transmit signals are leaving the building and getting through the master ETN bridges at the telephone company.

Patch Panel

Signal runs between equipment are routed through a patch panel. For example, the output of a tape machine appears on the tips of a patch port. The input to Channel 3A of the input console appears on the tips of another patch port. If the output of the tape machine is to be assigned to input Channel 3A, the tips are connected together through the normals. Connections between the input and distribution consoles also appear at the patch panel in this manner. A patch cord plugged into one of the patch ports breaks the normal connection. This feature provides versatility in equipment interconnection arrangements and also facilities isolating or bypassing faulty equipment. The patch panel provides a termination point for numerous sources and feeds that are used only occasionally and, therefore, not normalled to an input or output.

POTS Bridge Controls

The POTS to ETN bridge controls are presented to the operator as shown in the picture. There are two independent sets of three lines each which appear operationally as a standard six button telephone. The third set shown is the ICS general telephone extension. In this case the push buttons are mounted on a panel and connected to a trimline telephone set. The control action is push-push with latching relays controlling the circuitry. The buttons are color coded, and lighted to indicate status. The controls permit versatile use of the lines available. Each set of lines can be used for a conference call and both sets can be bridged together providing a six party conference. Each set of lines can be used directly with the studio or tied to ETN. As an example, one set can connect up to three callers to ETN, while the other set is being used to record a conference call interview as an insert for a future program. This versatility allows ICS to make maximum use of the service.

Constraints

Consideration for signal-to-noise ratio is important here as well as with other parts of the system. Noise from outside the studio is minimized by using soundproofing techniques and noise generated within the studio is minimized by using highly directional microphones. Interaction between the studio speaker and the microphone must be kept to a minimum. The problem is the same as discussed earlier in relation to station equipment.

The gain and number of simultaneously open studio microphones is limited by the presence of the live monitor speaker. Too high a speaker level or microphone gain creates echo conditions. These echo signals can cause gating problems which result in interruption of the program.

Some increase in the range of microphone gain is accomplished by acoustically treating the studios. By making the studio acoustically dead, better advantage can be made of the directional properties of the various elements involved.

The control room evolved over a period of time along with the development of the rest of the network. Control consoles and equipment to meet the unique needs of the ETN control function were not commercially available, at least not at a practical price. The solution was to modify some equipment from the broadcast industry design and build the rest in-house.

Rapid growth and changing demands require a high degree of versatility in control room equipment. As more features are added, an increase in operational complexity results. It is important, therefore, to review the control operation periodically to reduce this complexity. Redundancies in controls can be eliminated and those features regularly used can be locked in a set of operational patterns. Effort spent in planning the console layout and control inter-relationships will pay off in a smooth operation and increased operator effectiveness. Electronic white noise and cross talk generated by control room equipment are minimized by utilizing proper design and installation techniques.

Future

As the use of teleconferencing in education grows, so will the need to maximize the use of available telecommunication facilities. ETN, instead of being a huge party line, will be broken into a number of smaller regional networks which can be programmed separately or tied together as program distribution patterns require. The trend toward smaller networks using POTS and on premise conferencing equipment creates another need for a technical supervisory control function.

A number of current functions and new features can best be controlled by computer:

--As part of the control complex the computer can automatically set up network arrangements as identified by enrollments.

--Networks using POTS can be automatically dialed and conferenced.

--Continuous circuit testing can be carried out and trouble shooting streamlined.

--Visual support equipment at all locations, such as a slide projector and video tape machines, can be simultaneously controlled from the origination point.

The computer can poll and register non-verbal responses from each station location. For example students could take a multiple choice exam in real time, with the results immediately tabulated.

One way of measuring the acceptance of program technical aspects is by student user assessment. The technical components of ETN and SEEN programs, along with several other areas, are systematically evaluated through the use of the Program Evaluation Checklist (PEC).

Students in a random sample of ETN and SEEN programs are asked to rate each of the statements on the PEC and determine how well the positive statement fits the description of the program. On a 0 to 9 scale, 0 represents minimum approval while 9 denotes maximum acceptance.

In 1975, after the new Darome Edu-Com II equipment had been in use for two semesters, a random sample among 632 participants gave ETN's technical components a mean rating of 8.45. With this degree of user approval, the future of teleconferencing and its associated supervisory control function is only limited by the creativity and ability of educators and engineers to adapt technology to serve outreach education efforts.

STAFF MEETINGS BY TELEPHONE

Robert N. Dick
Assistant Chancellor
University of Wisconsin-Extension
Madison, Wisconsin

Background

Agencies, companies or groups which undergo major organizational change must devote considerable effort to staff reorientation. This is especially important when affected staff units have enjoyed considerable autonomy in their work. It is especially complicated when those staff units are both heterogeneous and decentralized.

Such was the case in 1966 when four components of the University of Wisconsin System were formally joined into a single new organizational entity called University of Wisconsin -Extension (UWEX). Staff members had to accommodate new policies and procedures and to relate to a whole new set of administrative officers. Faculty members in the separate institutions had traditionally participated in policy-making through committees and, from time-to-time, meetings of the entire staff. It was essential that this high degree of involvement and participation be continued in the new administrative structure.

The author at that period became director of the Division of Community Programs of UWEX. The division consisted of some 350 professional staff members in about 80 different locations throughout Wisconsin. Prior to the administrative merger, many of the faculty members in these previously separate Extension units did not even know those in the other units. Now they are being required to work as a team. The uncertainties were many and the psychological stresses great.

At a time when it was necessary to have quick communication and to develop mutual trust, it was both financially and logistically impossible to bring this large staff together often. Fortunately, by coincidence, a decision had been made to expand the Educational Telephone Network (ETN) into every community where these staff members were located. A weekly teleconference allowed for dissemination of information, solicitation of reactions and new ideas, and interaction among staff members. The period from 9 a.m. to 9:30 a.m. on Monday mornings was reserved on the network. Each decentralized staff group gathered around the ETN equipment. The number at any location might range from only one to as many as 20 persons. No one had had any experience with a telephone staff meeting for a group as large as this (350), so we simply learned as we went along.

The teleconference agendas spanned almost every conceivable institutional topic: personnel matters, budget procedures, committee reports, publication policies, public relations problems, consolidation of travel schedules, and research. Agendas responded to requests from faculty members and generally related to emerging policy and procedural issues.

In the course of working out our own problems with staff teleconferences, we began to discover some basic principles associated with the medium.

General Benefits

One of the greatest benefits of having staff meetings by telephone is the saving of both the cost and time of travel. In a state the size of Wisconsin, most of a working day can be consumed by travel to attend a conventional staff meeting, which itself might be of relatively short duration. Despite rising expenses of travel in an inflationary period, a far greater cost - though sometimes hidden - is in salaries covering staff time enroute to and from meetings. The telephone conference made it possible for each staff member to participate at his home base, reducing time enroute to virtually zero.

We also found it more productive and efficient to have frequent staff meetings, each shorter in length. An item could be discussed during a teleconference while the issue was current instead of having to defer it until some future face-to-face session. A standing appointment for these teleconferences each week routinized the procedure, keeping calendars clear and avoiding many conflicts.

The use of outside consultants in staff teleconferences is simple. Resource people may be connected in from their offices, hotel rooms and even through local telephones. Even the most heavily scheduled consultant can usually be made available if you can tie in an ordinary telephone wherever that resource person happens to be at the time.

Teleconferences also tend to be subject-focused. There seems less potential for staff members to wander away from the topic on the teleconference agenda. It is possible, however, to add agenda items on the spot just as one would at a face-to-face staff meeting.

General Limitations

There are some serious limitations to telephone networking for staff conferences. The greatest of these is the lack of a visual reference. At many meetings one wishes to refer to diagrams, tables, pictures, etc., or to write on a chalk board or flip chart. A disembodied voice from a loudspeaker without a visual reference can contribute to a sense of detachment, causing people to daydream and blunting their powers of concentration. Distribution of visual material by mail prior to the teleconference is an easy remedy when time permits. We also found it feasible and useful to put the staff to work creating their own tables, following oral directions during the staff meeting. Requiring each person to take notes also tends to focus attention visually.

Teleconferences are more susceptible to local interruptions than ordinary staff meetings. In our experience we found that a secretary or visitor would walk into the room where the communications equipment was located and, knowing that the microphone had to be manually activated to pick up voices there, would enter into a conversation with the local staff group. Sometimes staff members gathered at one ETN site and would engage in a private, local conversation about an issue being discussed and lose the thread of the network discussion. Behavior of this sort at a conventional meeting usually will cause raised eyebrows and possibly the bang of a gavel, but such locally distracting side conversations are seldom evident to the chairman of a teleconference.

When several staff members are gathered at a single location there may be some hierarchical constraints upon full staff participation. We found that the chairman of each local staff group tended to control the microphone switch; only his or her voice was heard on the system. That practice may possibly improve the efficiency of the telephone traffic control, but it discourages participation by junior members of the staff.

A large telephone network with loudspeakers is not a confidentially secure system. One never knows who may be monitoring at another location. UWEX staff members were particularly suspicious and guarded when discussing topics on which they didn't wish to be quoted. Over a period of time, by carefully restricting access to the system and demonstrating how very little was overheard by people who should not have had access to the system, confidence gradually was gained and staff members would speak with increasing frankness.

Teleconference participants are also inhibited by the absence of non-verbal reactions to their comments. At an ordinary meeting one can read the faces of colleagues to determine how far to press a point. Rather than risking going too far, some staff members say nothing at all without some visual reinforcement. Over a period of time, with the same staff group meeting regularly, it is possible to develop other kinds of reactive mechanisms, but our experience suggests there is nothing that equals looking into the eyes of another person.

In teleconferences involving a large number of people, there are always a few who tend to monopolize the discussion. Others, reluctant to get reputations for being "on stage" too much, will go to the opposite extreme and seldom, if ever, speak. Somehow the organization's reward system must recognize effective participation in teleconferences. It must be generally understood that neither being silent nor monopolizing is the way to gain professional recognition. The same principle applies to conventional meetings, but the teleconference pushes people toward one extreme or the other.

Adequate Planning is Important

Many of the shortcomings of the staff meeting via telephone can be eliminated or minimized by adequate planning. Sufficient lead time is essential to effective staff meetings, whether in conventional form or by telephone, but the decentralization of the latter ordinarily requires abundant planning time. Staff members need some reference materials early enough to be able to digest them and to secure locally-related information appropriate to their particular responsibilities. When materials are to be distributed through the mails, lead time must be sufficient. Those expected to participate in the meeting should know the purpose of the session and in particular what is expected of them. They should be advised as to who is participating and what outside resource people are to be involved. There should be few surprises when the group gets together on the telephone line.

The importance of a good telephone conference chairman cannot be overemphasized. Lacking the visual cues which come from those who wish to speak, the chairman must frequently ask if there are any comments and must be comfortable leaving a few moments of total silence while people decide whether and how they may wish to express themselves.

If the participants in a teleconference are not known to one another, it is helpful to circulate in advance a roster with a short biographical sketch on each person and an indication of his responsibilities vis-a-vis the subject of the meeting. Photographs of the participants may help to build a feeling of personal identity if the group will be meeting over a long period of time.

An aid to associating names and voices where the group is small is an initial roll call in which each individual is invited to respond with a short expository statement. In larger groups it is useful to have each person who speaks or comments preface those remarks with his or her name.

Participation by everyone can often be stimulated if one or two individuals are cued in advance to respond in a way that shows others what the expected procedure is.

The larger the group, the greater the amount of structure necessary to handle the interactive "traffic." In a large network where complete freedom to speak would create chaos, a geographical or categorial priority of response may be indicated. The chairman or moderator here might say "Does anyone in the northeastern part of the state wish to comment first?" or "Are there any (female staff members) (accountants) (training directors) who have something to add?"

There may be times when a vote is necessary. Where it appears from the discussion that most of the teleconference participants have about the same feeling about an issue, it is quite feasible to have a voice vote. In most cases the chair can easily discern the division of responses. If, however, there appears to be a fairly even division, a roll call vote may be taken. A mail-in ballot can also be considered if time permits. At times quantifiable information in some detail may be called for. A uniform reporting form sent through the mail can be a useful tool. When this technique is used however, it is important to feed the results back to those who supplied the information.

It is usually desirable to summarize teleconferences with minutes or notes distributed to all the meeting participants. The UWEX Division of Community Programs used a weekly newsletter to confirm and summarize the telephone staff conferences. In this newsletter significant topics were reported from the last meeting, reminders were issued and advance notice was given of future agenda items.

While it may seem to belabor the obvious, no meeting should be held if there is no purpose. Meetings are normally scheduled as a means of dealing with issues, but when sessions are scheduled on a regular basis, there is a tendency to confuse means and ends. Because the meeting is on the schedule, those in charge will search furiously for agenda topics. When an agenda has to be "manufactured" it would be wise to cancel the meeting and release the staff time. The author has yet to hear a complaint from a staff member because an agenda-less meeting was canceled.

Importance of Ground Rules

Although the analogy to sports may have some undesirable connotations here, anyone who is going to play a game must first understand the rules. So it is with teleconferences. Each person participating must know what he is expected to do and how to do it. A few ground rules can save time and reduce confusion.

The chairman at the outset should explain or reiterate who is present and what is expected.

A meeting can be conducted on a very open style or one of "speak only when spoken to." The chairman should make it clear at the outset what the expectations are. If staff members are expected to participate freely, they should be so advised. We found it useful to let staff members know that their conduct in staff teleconferences was an ingredient in their overall performance evaluation and might therefore affect their future salaries.

The chairman should provide verbal encouragement and support to those who make contributions during the teleconference. The actions of the chair in encouraging or cutting off discussion will be perceived quickly by most of the staff members on the line. They will react accordingly.

It may be useful to operate with the ground rule that "silence means concurrence and support." Particularly where a lengthy committee report is being discussed, it will save time if everyone understands that when a statement is read or made, it should be reacted to immediately; otherwise the presumption is that everyone understands and agrees with what has been expressed.

To protect confidentiality, no one - absolutely no one - should be given access to the teleconference system who is not entitled and expected to be there.

Rewarding Good Staff Meeting Performance

In a typical staff meeting, the chairman is usually the group's supervisor. He or she is able to observe the conduct of the staff members during the meeting and to form opinions about each individual's contribution to the process. That evaluation becomes one ingredient in decisions about salary rewards and eligibility for promotion.

That evaluation is more difficult in the teleconference format because the chairman is unable to observe those who are not speaking. The chairman may be too involved to recognize either the quantity or quality of individual contributions by those who do speak.

Recording the teleconference for later review by the chair will permit an evaluative analysis without time pressure. A secretary, on the line to take notes, can also detail who said what as a means to evaluating the substance of a contribution.

If this evaluative approach is taken, all participants should be so informed.

Response Mechanisms

Regular participants in teleconferences can quickly learn to respond through many supplemental means. Any 3 x 5 card, for example, may be used as a secret ballot with only the word "yes" or "no" typewritten in. Numbering the yeses or nos on a card or placing them in different positions according to oral instructions will allow for several votes on the same ballot. The 3 x 5 cards can then be mailed and centrally counted.

Comments or suggestions may simply be solicited by mail. We found most staff members willing to jot a few ideas down on their own letterhead. This is not an acceptable means for assessing total group sentiment, but it tends to identify those who feel strongly in one direction or another. It is also likely to produce a few ideas generated upon reflection and which were not covered in the teleconference discussion.

There are often times when a quantifiable response is needed. During the early period of UWEX Division of Community Programs staff teleconferences a standard response form was developed (see appendix). It provided a set of five point scales which could be used in many different ways. Supplies of the form were distributed to all faculty involved in the Monday staff meetings. Instructions for each use were given during the teleconference. Staff members checked the forms during the meeting or immediately afterward and mailed them to the divisional office for tabulation and analysis.

This particular standard form provided for twelve scales, each identified by a letter. The chairman might ask for a simple yes or no vote on any issue by instructing the staff to use scale A and to check "1" if the response was "no" and "2" if the response was "yes."

Other scales could quantify feelings about different dimensions of the same issue. For example, staff members might be instructed to use scale B to indicate whether they thought a proposed course of action was desirable. In this case a ranking of "1" might be designated if the respondent thought it quite undesirable, while a check at the "5" position showed that the respondent thought it was highly desirable. Checks in the "2," "3" or "4" positions would show intermediate reactions.

Scale C might then be used for a response as to the amount of effort which that same proposed action would require of staff members. Again, a polar position of "1" could indicate very little staff time was needed; the opposite end of the scale could show that a substantial investment of time would be required.

A third dimension might relate to the payoff or effectiveness of the proposed action. On scale D a "1" could indicate that the respondent thought the results would be minimal and a "5" that there would produce very substantial benefits, with the "2," "3" and "4" positions filling out the range of expectations.

This standard scaling instrument has also been used to show the gross allocations of time devoted to particular activities. In this case each numbered block was stipulated to represent up to 20 percent. If 80 to 100 percent of one's time were devoted to an activity, box "5" would be the appropriate one to check. A 30 or 35 percent allocation would result in a number "2" check. Simple oral instructions to experienced staff are sufficient to guide their responses into a quantifiable format.

When one is familiar with the response instrument, only a little imagination is necessary to relate it to new uses.

Confidentiality of Responses

Even though the identity of the respondent might need to be protected in certain situations, some demographic data may still be collected. The UWEX scales were used to indicate sex, age, functional responsibility or other factors relating to each individual respondent. Oral instructions were given during the teleconference.

When the form was designed it was our intention to show staff members that we valued their opinions but would not penalize anyone whose responses were not in line with "company policy." The blank at the bottom could be used for a signature or any other means of identification. At first, when dealing with sensitive issues, the respondent was not asked to sign the form or reveal any information about himself. Later, as greater trust was built, we would ask respondents to write in on the bottom line their length of service with the organization, functional responsibility, or any other single factor which was felt important. Later certain combinations of these factors were requested, with an attendent increase in the possibility that individuals could be identified through particular combinations. At that point many respondents simply began signing the forms. Where it is desirable to identify individuals within large groups of respondents, an employe number can be entered for statistical control purposes.

In order to get consistent and useful data from staff members, several elements are necessary:

1. The respondent must believe that you are seriously interested in the information.
2. You must let him or her know precisely how to supply the information to you.
3. You must feed back to the respondents summaries of the information supplied. This is important regardless of whether data is quantifiable or supplied in narrative form and abstracted.

General Conclusions

The teleconference method can save time and money for a decentralized organization with large staff units which must interact frequently. To be effective, the purpose of the teleconference and the procedure must be clear to the participants. The more that staff members experience the technique, the more effective they become in using it. Visual references supplied to each location in advance or created by participants on the spot, help to focus attention during the meeting. Supplemental data, gathered through some sort of mail-in response form, improves employes' interest and participation and also provides valuable information for decision-making and evaluation.

APPENDIX

UNIVERSITY EXTENSION
The University of Wisconsin

____
Date

MULTIPURPOSE RATING SCALES

A.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
B.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
C.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
D.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
E.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
F.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
G.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
H.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
I.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
J.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
K.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
L.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

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The Role of Telephone Technology in the Continuing Education of Health Professionals

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University of Wisconsin-Extension
and
Center for Health Sciences

Abstract. Ten years' experience in utilization of instructional technology in continuing education programming at the University of Wisconsin is reported. Specific media and methodology used include telephone conferences, dial access library, and slow scan television, with attempts at evaluation of each described. The experience indicates that more attention must be given to identification of educational needs, deficiencies in medical school training programs, and evaluation of end results before optimum use of educational technology in continuing education is possible.

In 1963 the Faculty of the University of Wisconsin Center for Health Sciences decided that the Center should assume a greater responsibility for the continuing education of health professionals. In determining the form this commitment should take a number of factors were considered. First, the professionals to be served are widely scattered geographically. Secondly, there is evidence to show that adults learn better through problem-oriented education. Third, there is also evidence that people acquire and retain information better if it is presented in smaller units with great frequency rather than massive doses on occasion. Fourth, there is a substantial volume of continuing education available to physicians and a lesser amount to allied health personnel; however, these traditional exercises appeared very time consuming and expensive for the potential benefits derived. The visible commitment took the form of a Department of Continuing Medical Education jointly sponsored by the Center and University Extension.

The belief was that if the University were to make a worthwhile contribution it would require innovation. There appeared to be promise in making current, pertinent and authoritative information available when, where, and in the form health professionals required it. This belief led to investigation of the potential of educational technology, and specifically in experimentation with:

A. Telephone Conferences.
B. Dial Access Tape Recording Library.
C. Health-Line and Health-Line Highlights.
D. Slow Scan Television.

This technological emphasis is reflected in the educational services provided during the 1974-75 academic year (Table 1). Of the 5159 instances where physicians used an educational service, 3502 (65%) involved media. For allied health personnel the figures are comparable: of the 3,156 instances where services were used, 1,660 of these or 52% involved media. Admittedly, some of the media services involved a five-minute tape recording while a "live" exercise may have been a three-day conference. However, in examining data which take this imbalance into account, there were 64,449 individual hours of instruction presented, of which 29,335 or 44% involved media.

Table 1

1974-75 Recorded Attendance or Utilization

	M.D.	Non-M.D.	Total	Individual Hours of Instruction
Face-to-Face Teaching	1,657	3,156	4,813	35,116
Mediated Instruction				
Telephone Conference	350	1,361	1,711	15,809
M.D. Dial Access	2,453	299	2,752	275
Health-Line		129,000	129,000	12,900
Audiojournals	699		699	349
Sub-total	3,502	130,660	134,162	29,333
TOTALS	5,159	133,816	138,975	64,449

A. Telephone Conferences

The telephone circuit was initiated by the University of Wisconsin in November, 1965. The Department designed the project with the following objectives:

1. To offer instruction of the highest caliber.
2. To be truly continuing.
3. To incorporate topics directly applicable to clinical practice.
4. To be of low cost to the physician.
5. To reduce substantially the amount of

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time for which the physician must absent himself from the responsibilities of his practice in order to participate in a continuing education program.

Circuit And Network

When 10 or more physicians from 1 community indicated interest in participating in the project, a conference station was established at the local hospital or clinic. Station equipment included a loudspeaker connected to the incoming telephone line, a telephone handset for communication with all the other stations on the network, and a 35 mm. slide projector. Most of the programs originated from the University of Wisconsin Madison campus.

From November, 1965 through February 15, 1966 general medical conferences were conducted over a traditional telephone conference circuit. An operator called in each station fifteen minutes prior to the program time and established the network. At the conclusion of the hour program the circuit was broken down.

The stations were divided equally between the morning circuit (7:15 A.M. to 8:15 A.M.) and the noon circuit (12:15 P.M. to 1:15 P.M.). For several years the same lecture was delivered to each circuit but the question periods depended upon the participants involved. In recent years the noon circuit has been receiving a replay of the morning lecture and discussion.

From mid-February through April, 1966 the conferences were conducted over a network of private telephone lines leased on a full-time basis for teaching purposes. This eliminated the need for operators, switchboards, and other equipment which greatly reduced the potential for malfunction or personnel error. The circuit then became available for experimental teaching programs for physicians and for those in allied health fields. Initially, there were 18 stations scattered throughout the state. The station closest to Madison was approximately 30 miles away and the farthest was 350 miles. There were approximately 190 physicians enrolled at this time and instruction was provided at approximately $2 per person per hour. In the next three months, 9 stations, with about 10 physicians at each, were added to the network. (Table 2) Since that time there have been between 55 and 70 hospitals in the network each year.

Table 2

University of Wisconsin Continuing Education Courses Given Via Telephone Circuit, 1965-66

	Enrollment	Lectures*	Individual Hrs. of Instruction
Medical Conferences	286	24	4,680
Electrocardiography	43	18	774
Pediatrics Journal Club	21	3	63
Social Work	236	4	944
Veterinary Science	119	2	588
X-Ray Technology	217	1	217
Pharmacy	150	2	725
Nursing	684	12	4,807
Medical Technology	220	1	220
Total	1,976	67	13,018

*Medical conferences and nursing programs were presented twice, making 48 sessions for the former and 24 for the latter.

Program

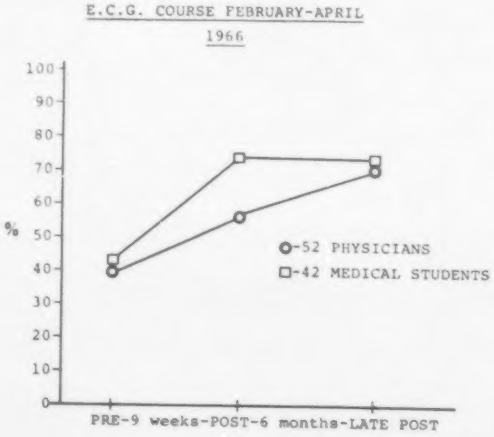
Approximately six weeks prior to the program date, the thirty-minute lecture is tape-recorded, and the lecturer provides an outline of his lecture along with the visual materials he plans to use. The visual materials are duplicated on 35 mm. slides and sets of slides are distributed for the projectors at the stations in the network. The slides and lecture outlines are mailed to each conference station two weeks in advance of the program.

At the time of the program the recorded lecture is transmitted over the network. The lecturer, at the appropriated time, calls for the slides, which are shown at each conference station. After the lecture there is a 30 minute discussion period with comments and questions being dealt with as determined by the conference moderator. All questions and answers are heard over the entire network.

There is random coverage of subject matter in the curriculum, which is designed to incorporate topics directly applicable to clinical practice. Participants are asked to evaluate each program and a roll is taken at each station as an accurate record of attendance is required.

Evaluation of the Technical System

The newness of the system to Wisconsin in 1966 did impose the obligation for evaluation of the telephone network and a number of limited studies were carried out. Most significant of these, at least to the originators, involved measurement of retention and acquisition of knowledge in a course on electrocardiography. The same course, involving 16 hours of instruction, was presented by the same instructor to a group of 52 physicians over the telephone circuit, and concurrently to a class of 42 third-year medical students in a classroom setting. Pre-, post-, and late post-tests were given; the results are presented in Fig. 1. Both groups demonstrated an acquisition of knowledge, with the medical students achieving slightly higher immediate post-test scores. Both showed retention of knowledge after a six-month interval; the medical students had an anticipated decay but the practitioners demonstrated additional improvement. While it is only conjecture, one possible reason is that those in practice put their new knowledge to use and continued to learn, while the medical students directed their study to other areas of medicine. The important conclusion, however, was that use of media did not interfere with the educational process.



Evaluation efforts have not always been so successful. Upon acceptance of the telephone circuit as an effective teaching medium, one of the subsequent studies attempted to determine if additional independent study through assigned "home work" would increase the effectiveness of the conferences. An eight-hour course in hematology was designed and registrants divided into an experimental group which would receive outside reading assignments, extra slides to study, and self-assessment tests in addition to the conferences, and a control group which would only attend the conferences. This course was measured by pre-test and immediate post-test.

The control group showed a slight, but statistically insignificant increase in knowledge. The experimental group showed a slight, also statistically insignificant, decrease. In eight hours of instruction for one group, and a good deal more than that for the other, the course had accomplished nothing.

Faith in our faculty and medium led to a more detailed examination of the entire study. This analysis indicated that course content was at a level of sophistication appropriate to a specialist in internal medicine with a special interest in hematology, while the participants were general practitioners who did not have the knowledge base required to assimilate the course content. Our conclusion was that we had succeeded in confusing, rather than teaching them.

A succession of similar minor studies invariably uncovered human rather than technical shortcomings, and the overall conclusion is that the medium is as good or bad as the educational programming provided over it.

At the present time, we believe the telephone conferences are meeting the initial goals set for them. By offering a limited amount of information frequently, the circuit makes it possible to achieve truly continuing education. Subjective response from participants indicates that for the most part the programs are relevant to clinical practice. The average cost of $2.68 per individual hour of instruction in 1971-1972 appears to be remaining static and is reasonable. The fact that the programs are offered for physicians in the early morning hours, and each participant can be making his hospital rounds within a few minutes of the end of a program, means that he is not removed from his practice for any substantial period of time. The department thinks its calibre of programming is high, but there has been no substantiation of this goal.

It may well be that this educational delivery system is more appropriate for the continuing education of the allied health professionals. The majority of these individuals are hospital-based and have economic constraints which are significant by comparison with physicians. Many are women with family responsibilities which make travel to obtain continuing education a practical as well as fiscal impossibility. The Department of CME has programs for the following allied health professions.

Hospital Accounting Seminars
Hospital Administration Seminars
Hospital Seminars - General
Institutional Food & Nutrition Services
Medical Library Seminars
Medical Record Administration Seminars
Medical Technology Seminars
Occupational Therapy Seminars
Physical Therapy Seminars
Public Relation Seminars
Radiologic Technology Seminars

B. Dial Access Library

In April of 1966 the department began a feasibility study of a second use of the telephone in continuing education. There appeared to be need for an immediate source of information which was not being met by traditional reference sources. Either standard references were not immediately available, or the physician had reason to believe that the information they contained was out-dated.

To meet this apparent need, a number of short (4-6 min.) tape recordings were made which dealt with the diagnosis and treatment of several specific diseases and conditions. These were placed in self-rewinding cartridges that could be played on tape repeaters connected to telephone lines. In this way, a physician who felt insecure about handling a particular patient problem could call the service at any time of the day or night and listen to the appropriate tape recording. On the basis of utilization figures during this feasibility study, funds were obtained to expand the service. At present the library contains over 500 tape recordings. It is available to physicians in Wisconsin on a subscription basis and through a contractual arrangement with the federal government to all physicians in Veterans Administration hospitals and Public Health Service clinics and hospitals throughout the United States.

The service has been evaluated by means of a record of all calls received, and a post-card survey of users. The initial intent was to provide a service for family physicians, but it has proved to be of almost equal use to specialists and those in training. (Table 3) While designed to meet specific patient problems, it is being used as a general educational resource with equal frequency. (Table 4) Perhaps most important, 19.7% of the users surveyed (from among those calling with specific patient problems) indicated they had changed their management of the patient as a result of information obtained from the tape recording. Another 12.8% of the total users surveyed (from among those who called for general educational purposes) indicated they would change certain aspects of their patient care as a result. Thus nearly one-third of the calls resulted in a reported change in behavior by the physician.

Table 3. Dial access library distribution of calls by type of practice (22 months)

Type of caller	Percent of total calls
General practitioners	34.5
Specialists	28.1
In training	28.4
Others	9.0

Table 4. Dial access library primary reason for call (nine months)

Reason	Percent of total calls
Specific patient problem	44.8
General reason	47.6
Both	7.6

The dial access library has been of some assistance in identifying possible common educational needs. By maintaining utilization records for each specific tape, and total usage for tapes in a general area of medicine, it is possible to make judgements in curriculum planning. For example, some years ago Wisconsin physicians have most frequently called for tapes on marriage counselling, the Rh-negative pregnant patient, cardiac arrhythmias, and drug abuse by teenagers. Veterans Administration physicians have most frequently called for tapes on drug abuse and alcoholism. In depth continuing education programs have been given utilizing other educational methodology including the telephone network.

The concept of the dial access library has been adopted by others since its inception but at present there is no objective evidence as yet that use of the dial access library results in improved patient care.

C. Health-Line and Health-Line Highlights

This telephone random access information retrieval system may have its real impact in the education of the consumers of health services. Health-Line is a random access service for hospitalized patients and their families which is available to patients in the 4 community hospitals in Madison. There are approximately 350 short, authoritative messages relating to health, hospitals, special tests, etc. in this library. An off-shoot of Health-Line is Health-Line Highlights in which a single message-a-week is available to the community on an electronic telephone answering device. It is publicized through the print and electronic media. We receive approximately 15,000 calls a month to these two services.

D. Slow-Scan Television

All of the media used by the department at this time require advance production of educational content. It appeared to the staff that there would be merit in making some of the more than 50 educational events occurring weekly in the Medical Center available on a broader geographic basis. Presenting the audio portion would be simple, utilizing telephone lines. Real time transmission of video, however, presented problems since there was no statewide educational television network available in Wisconsin and the prospects of financing such a system did not appear realistic.

For this reason, the department began an experiment with slow scan television, a method of transmitting still visuals over regular telephone lines and displaying them on television monitors at remote sites. While the investment in equipment would be essentially the same as with regular television, the continuing costs of technical staff and transmission lines would be greatly reduced.

A prototype system was constructed by a regional electronics firm and installed in four community hospitals. Due to technical problems which arose in establishing and maintaining the system, little valid educational use or evaluation were possible. While the equipment has been modified for an experiment in satellite communication, the possibility of its use on general continuing medical education is not being pursued at this time.

VALUE OF MEDIA

It is the concensus of the staff of the Department of Continuing Medical Education that the use of instructional media has enabled it to present a variety of continuing education to substantial numbers of health professionals in Wisconsin. In the process, it has carried out limited evaluation which leads to the conclusion that the use of media does not detract from the teaching-learning process. However, the evaluation has not confirmed that the educational programming presented via media has in any way improved the care delivered to the patient, which is the ultimate measurement of any continuing education program. However, for the immediate future, and until the techniques to measure quality of patient care have been fully established, there appears to be sufficient supporting information to warrant continuation of present programming and innovation in methods and media.

CONTINUUM OF EDUCATION

In exploring some of its shortcomings in continuing education, the department found itself considering the total educational process to which health professionals are exposed, and viewing it in the context of recent educational philosophy. This led to the questioning of some basic dogmas upon which medical education in the United States is built.

The student, through his minimum of eight years in higher education, is required to make significant adjustments in his learning patterns. As an undergraduate, he is directed through a structured course of study centered on certain prerequisites he must complete for entry into medical school. During his first two years of medical education he encounters a similar structure for mastery of the basic sciences, based on reading, lectures, and laboratory experiences. For the next two years he acquires clinical knowledge and skills by substituting a tutorial relationship with the faculty for his laboratory exercises, and continues with his reading and lectures. Upon receipt of the medical degree, and entry into internship and residency training, the tutorial relationship becomes dominant and the importance of lectures decreases, while reading and conferences continue as primary study methods. He has access to a multitude of conferences, many dealing with abstruse but interesting cases, in the course of which the student may well fail to acquire a realistic view of the everyday practice of medicine.

Upon entry into private practice, the new physician not only has to face these significant challenges, but also finds himself separated from the educational system upon which he has relied for so many years. No longer is someone else responsible for determining his educational needs and developing the necessary curriculum. He is also separated from the educational methods on which he most recently relied.

If this rationale is valid, it is small wonder that the practicing physician leans heavily on the learning methods which are most readily available, reading and discussion with colleagues. Many supplement these with other familiar methodologies such as lectures, when they are available. With this background, it is logical that the introduction of technology into the continuing education field is a slow and often disappointing process.

Equally, in his formative years in training for medicine, the student is given little opportunity to define his own personal objectives, and, perhaps more important, to learn the manner in which he can most comfortably and efficiently acquire the concepts and skills necessary for the practice of high quality medicine throughout his professional lifetime. He has little opportunity to assess his own progress, yet he will have to take full responsibility for this through the subsequent forty years of his learning life.

The assumption is therefore made that if the medical school and graduate experiences can be structured so that the student takes an increasing role in his own objective setting, learning methodology, and progress assessment throughout his training period, he will be better able to manage the transition into delivery of optimal care, using his own unique learning styles and capabilities to maintain and increase his competence throughout his professional lifetime.

On the basis of these assumptions, those responsible for continuing education at the University of Wisconsin now find themselves involved in the medical school teaching program. The intent is not that the structured portion of medical education must be changed to accommodate continuing education, but that the entire continuum of medical education will be improved by the changes suggested.

SUMMARY AND CONCLUSIONS

The department has confidence that instructional technology is making a valuable contribution to continuing education of health professionals in Wisconsin. It is satisfied that educational services are being provided for substantial numbers of health care personnel that would not be possible without the emphasis on media. There is also some objective evidence, outside of the obvious virtues, that the variety and volume of programming eventually benefits the patients.

However, there is a growing conviction that the full potential of the instructional technology is not being realized. Before this can be accomplished there must be rational methods of needs assessment and perhaps some basic changes in the continuum of medical education.

Finally, if the ultimate goal of continuing education is optimum quality of health care for the patient, the current means to assess this quality must be validated so that the faculty, program planners and practicing health professionals have objective data available to them as the basis for making educational decisions.

ILLINOIS TELENET 70-76

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TeleNet Coordinator
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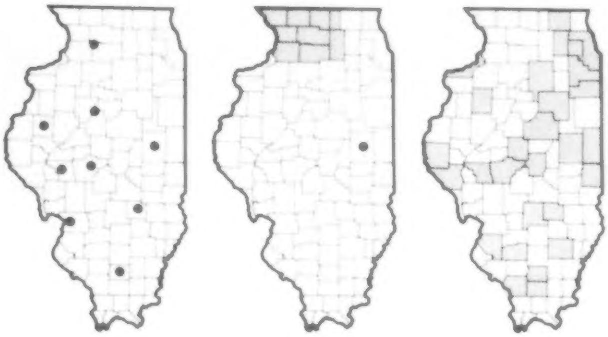
TeleNet

Illinois TeleNet is a 48 station dedicated telephone network. Most of the stations are located in county Cooperative Extension Service offices; a few are in Extension Regional Directors' offices. Each of the stations is equipped with amplifying equipment, that can be used in three or more office complex locations. Standard telephone jacks are located in offices, board rooms and meeting rooms in each Extension complex.

Current Illinois TeleNet is three interconnected systems. A dedicated four-wire network connected to each of the eight existing regional offices, the director's office, and two other administrative offices. A second network connects all of the offices in Extension region one in the northwest corner of the state. These nine county offices and the regional director's office are interconnected and connected to the university TeleNet office.

Finally, a thirty-one station network connects other county Extension offices throughout the state. A switching arrangement allows these three networks to be seperated or to be switched together either as one, two or three networks. Thus, region one can be connected to the general network while the regional office network is kept intact.

Illinois TeleNet



Regional Offices — Region I — General Network

This year-old arrangement has evolved from an original 17-station network installed in November of 1970. Rate advantages, improved programming and special funding allowed us to expand to 26 stations by 1973.

Since the pattern of permanent TeleNet installations left several obvious gaps resulting in inconvenience and excessive travel, we provided the opportunity for counties to install regular phone jacks and to use the 50A conference phones in the two-wire format for their programs. We kept a supply of two-wire 50A units to mail to the users on demand. In addition, we established five additional county locations where we paid all of the costs of the 50A units and WATS charges for any regularly scheduled TeleNet program. Thus, we have extensively tested the two basic teleconferencing arrangements, dial-up and dedicated facilities.

In 1974, Extension Region 1 advisers (agents) agreed to extend their budgets and include funds to allow a region-wide installation of the net. This network has proved to be so valuable that they have not only continued to include TeleNet in their budget but also have provided the incentive for other TeleNet expansion. Illinois Extension administration is currently considering various plans for expanding TeleNet statewide. Obviously, the most effective system would be one that reaches every Extension office of the state.

Equipment

In the 1970 installation we used push to talk handsets and Western Electric 106B speakers, wall or desk mounted. These proved to be frustrating from three standpoints. First, the push to talk feature proved to be too difficult for the casual user. Advisers, who used the network regularly, quickly adapted to this feature but, the occasional user experienced a high level of frustration. Secondly, the 106B speaker was not designed for large audiences and the quality and quantity of sound required for groups of more than 15 persons could not be obtained. Providing enough speakers for the larger Extension audiences proved to be unnecessarily expensive. Several advisers juryrigged amplifiers to their systems. However, even skillful juryrigging frequently leads to system failures, and other dissatisfactions. Finally, the 106B speakers had to be permanently mounted. Permanent mounting resulted in conflicts in the use of space. TeleNet programming interfered with other Extension programming or prescheduled use of rooms and space making it impractical for county staff to take advantage of TeleNet programming.

During 1973 we decided to experiment with the Western Electric 50A Conference arrangement, a phone unit developed to be used point to point. This amplified phone unit was converted to a four-wire format and installed in several offices of our dedicated network. It's advantages of portability, mailability, convenience, compactness and improved amplification immediately proved its worth over the 106B's and handsets. We quickly converted the entire network to 50A units and used this equipment on all subsequent installations.

Currently we are testing two other pieces of equipment; the Western Electric 50A-1, an improved model of the 50A, and a unit made by Darome, Incorporated. The Darome unit was developed in conjunction with the University of Wisconsin and used on their telephone network. We are experiencing no problems by using these various amplifying units on the same dedicated network.

Programming

In November of 1970, Dr. J. B. Claar, Extension Director, met with the Macon County Illinois Extension

Council via TeleNet for the first use of the new Extension system. Also, in November Esther Siemen Textiles and Clothing Specialist, presented the first statewide in-service workshop via the net. Her program was well recieved largely because of the Hawthorne effect, but contained many dissatisfactions because we were not aware of all the pitfalls associated with teleconferencing at that time.

Subsequent programming was slow to develop partly because Extension programs are planned in concert with councils and committees during the winter months for a program year starting the following in July. Thus, the Extension program year was already fully developed by the time TeleNet was born. Therefore, few programs including TeleNet were initiated at the county level for the program year 71-72. Without demonstrable successes in TeleNet programs during the year, most of the 72-73 program planning was also done without including TeleNet as a delivery medium. Thus, we in Illinois Extension have developed a pattern of programming for TeleNet originating at the state level.

The home economics specialists in 1971-72 led the way in using TeleNet with nearly every specialist developing and delivering at least one program or series of programs during the year. However, early model TeleNet came complete with many built in dissatisfiers. These fell into three categories: equipment, program assistance and training. As indicated earlier, we have experimented with various equipment choices which caused some concern for the inexperienced user. And the various phone companies did not seem to have the level of concern we did for such items as clear channels, interruptions, disconnections, test tones and equipment maintenance. Balancing sound levels was a continuing problem, along with frequent failures and line interruptions.

In 71, 72 and 73 we did not have staff either for adequate training of participants, training of presentors, or for program development and other support. In the fall of 73 we finally were able to hire Alice Wiese in a half-time TeleNet support position to assist in these important support functions. Since that time both the quality of programs and satisfactions with programs has demonstratively increased.

In 1972, and again in 1973, the agricultural economics department conducted a statewide farm management tour via TeleNet. Rather than bring a thousand people to a swine farm with the attendant hazards associated with virulent diseases we went on a detailed photo tour of the farms and used TeleNet to present the tour in 20 Extension locations.

Agricultural economics also piloted a TeleNet tax school for beginning income tax practitioners in 1972. With the aid of agricultural communications staff a teaching plan was developed, visuals and workbooks produced and the program delivered. Don Doerr, a farm management area adviser, was the instructor. He presented one day of the three day course from each of the three sites. He also presented the same course using the same materials in a face-to-face mode. Pre-post testing of both groups revealed no significant differences observed in the level of learning based on the two approaches, and learning did take place pre-to-post in both groups. In 1973 and 1974 this program was offered, accepted by the advisers and expanded to include more stations and more practitioners. Each year the pre-to-post examinations indicated that real learning and high levels of both acceptance and satisfaction accompanied this TeleNet tax school. Changes in staff assignments and other factors caused us to sit out 1975; however, we are developing the 1976 schools to be delivered this October and November.

The corn blight crisis of 1970-71 provided another kind of opportunity for use of Extension TeleNet. Advisers needed accurate, current information on the status of the disease, its economic importance, agronomic implications, harvesting drying and feeding instructions, seed selection data and other similar information. TeleNet was used in the spring and summer of 1971 to help provide some of this relevant information for the advisers. More importantly, this crisis demonstrated that we had a useful tool to provide emergency information with the opportunity for inputs from a variety of sources and the chance for interaction between advisers and specialists on critical issues. Another agricultural crisis situation occurred in the spring of 1975 when a weather-herbicide-thrips crisis occurred in the Illinois soybean fields. This crisis was easily and quickly handled via TeleNet. At this writing (4/11/76) there is an outbreak of Bovine tuberculosis in 17 Illinois counties. TeleNet is being used to help alleviate this potentially explosive situation.

Using a very simple format of providing a group of specialists at any of the points of the system on a regularly scheduled basis we are able to update our county adviser staff on a weekly basis in such disciplines as entomology, plant pathology, ornamental and production horticulture, agricultural economics, and soils and crops agronomy, including weed control. The specialist position their concerns for the advisers, update them on the situation in brief lecture format, then the advisers probe to get their own or their clients questions answered. Agricultural economics conducts two similar updates each month. The only difference is that these programs are open to selected public, information is provided in written form for reference and study in advance of the program, and experts are brought to the TeleNet system by phone from outside the state. For example, in the beef-feeder cattle situation update reports, buyers and specialists in feeder cattle producing states are contacted via regular phone for their direct inputs.

The Extension swine committee in 1973 conducted a series of swine seminars. Each of the team of four specialists made a presentation before a live audience and three remote audiences. Each specialist manipulated the visuals at his location for the four presentations. Thus, the audience had the satisfaction of a face-to-face University of Illinois specialist and the benefits of all four presentations. The team presented seminars for four audiences in four widely scattered locations on each day of the swine seminar season.

This year, 1975-76, the swine committee developed a Professional Pork Producers Short Course in an attempt to reach the above average pork producer with a challenging program. Using TeleNet, the seven member team conducted a series of weekly schools in two locations each night Monday thru Thursday. By alternating locations weekly each audience received at least three face-to-face presentations and a maximum of four remote presentations. Evaluations and reactions, following, indicated a high level of student satisfaction. This short course and the TeleNet Beginning Income Tax Preparers School were two programs for which substantial fees were charged.

Extension horticulture has been one of the fastest growing, most effective and best received program presentors. Starting in the Spring of 1973 with a three-night series on home landscaping, they have expanded to 23 nights in 1976 covering a wide variety of horticulture topics including; pruning both ornamental and fruit trees, vegetable gardening and growing house plants. This series in 1976 reached an estimated audience of over 10,000 persons, with the largest one-night audience of over 1,050.

Other TeleNet programs have included: training of advisers in the use of CAMPI; eminent domain associated with right-of-way aquisitions; a credit course on teaching metrics; seventeen nights of horse and pony management, including fecal analysis; two nights on severe weather and weather modification; livestock waste regulations; legislative updates; the 4-H federation; working with volunteers; establishing soil-testing stations; and raising fish in confinement.

Evaluation

Evaluation of TeleNet programming has been conducted in three general formats: attitudes of clientele expressed on a Likert format, pre-post cognitive measurements, and structured open-ended responses from both advisers and clientele.

Thousands of Extension clientele have been asked to respond to TeleNet programming. Their attitudes have been surveyed concerning the TeleNet system, sound quality, the effect of having other groups on the same program, satisfactions with a non-face-to-face format and other similar categories. Briefly, I will report the results of two of these evaluations.

Dr. McKenna and Alice Wiese are reporting home economics update elsewhere (TeleNet, Yesterday, Today and Tomorrow) so I will only provide the briefest description. Update was an in-service education series for Extension county staff. One of the key questions asked the participants following the series was "Do you favor keeping to once a month schedule next year?" Eighty-two percent of the participants said yes, and only twelve percent said no. This and other responses helped Dr. McKenna and her associates to decide to repeat the program, and helped determine a format, schedule and content for subsequent update programs.

The Professional Pork Producers Short Course provides a recent typical example of agricultural TeleNet. This course was presented in nine locations, over seven winter nights, by seven specialists. Enrollment was limited to 50 persons per location, a fee was charged and take-home materials provided. Each of the nine groups of pork producers received at least three programs remotely and three face-to-face. A Likert-type scale was used to test producers attitudes concerning the program, TeleNet, the instruction, visualization and other factors. Following is a copy of the first page of the evaluation form with responses tallied.

Evaluation of other schools, programs, meetings and workshops delivered via TeleNet have demonstrated similar levels of satisfaction with programs delivered remotely. Adequate preparation and staff support is essential to satisfaction on the part of the specialist delivering the program, the adviser offering the program, and to local audiences or audience members. With good visualization, careful attention to detail and appropriate follow up, almost any subject may be successfully taught via TeleNet.

TeleNet

FEEDBACK - TELENET PROFESSIONAL PORK PRODUCERS SHORT COURSE 1975-76

A. The developers of the Professional Pork Producers Short Course would like to provide the best possible future programs of this type. Please help us to help you. Read each statement and indicate your responses.

B. I attended the following sessions:

		Please Circle	
G. Carlisle	Nov. 19-25	Yes	No
A. Muehling	Dec. 1-4	Yes	No
Dr. Ladwig	Dec. 8-11	Yes	No
J. Diehl	Dec. 15-18	Yes	No
A. Mueller	Jan. 5-8	Yes	No
Dr. McQueen	Jan 12-15	Yes	No
D. Vanderholm	Jan. 19-22	Yes	No

		Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
1.	I got information I can use in making effective management decisions	113	207	3	2	0
2.	Most of the time there were enough visuals used in these presentations	73	239	4	5	0
3.	The visuals used were effective in supporting or clarifying the points being made by the teachers	85	221	7	2	1
4.	The TeleNet presentations held my attention as well as the in-person presentations	27	120	25	140	14
5.	Adequate discussion is difficult due to the mechanics of asking questions on TeleNet	19	111	44	146	48
6.	The presentations were too detailed	0	15	53	198	40
7.	I would recommend this program to my friends	137	177	13	0	0
8.	The course materials were worthwhile	131	179	6	2	0
9.	Too much subject matter was covered in some of the programs	4	63	54	180	21
10.	I would attend a program presented via TeleNet again	62	217	37	9	6
11.	It helped me to learn when questions came from other stations on the line	36	207	64	16	4
12.	Having two or three groups taking part hampers the program	11	41	74	186	14
13.	Adequate time was provided for a question and answer period	49	258	6	11	4
14.	Sometimes too much minor detail was presented, interfering with in-depth subject matter coverage	15	79	78	143	11
15.	I felt I got my money's worth from these programs	125	187	11	4	1

TELELECTURE IN MINNESOTA

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Telelecture Growth

Nine years ago four Minnesota County Extension Agents requested help on educational programs on horse management and nutrition. Since specialist help in this area was limited to a professor who was carrying a full class teaching load, telelecture was considered. Arrangements were made with the specialist to provide a series of three telelectures to each of the four counties at weekly intervals. The audiences and the County Extension Agents were very well pleased with the series.

In 1968-69, 18 County Agents decided they would like to have the series of three telelectures on horse production. Arrangements were made to meet this request.

In the summer of 1969 working with the District Directors and selected specialists I met with groups of agents in each district to discuss telelecture as an educational method and to describe the six subject matter areas in which telelecture would be available. Thirty-three counties decided to take three or more programs by telelecture in the 1969-70 program year. Arrangements were made to meet these requests.

By the spring of 1970 sixteen specialists had decided they would be willing to present subject matter by telelecture. Fifty-three counties requested three or more programs by telelecture for the program year of 1970-71.

The peak year was 1972-73 when fifty-four counties received 394 programs by telelecture.

The number of counties using telelecture and the total programs conducted by telelecture has decreased slightly since 1972-73 but is still a major educational method used by the Minnesota Ag. Ext. Service.

Telecture Use in Minnesota

Program Year	Counties Involved	Different Subjects	No. of Programs
1967-68	4	3	12
1968-69	18	3	54
1969-70	33	6	203
1960-71	53	16	289
1972-73	54	25	394
1973-74	46	71	276
1974-75	45	88	325
1975-76	40	73	368

Percentage of telelecture programs presented by Program area.

1972 - 1976

Program Area	% of Total
Agricultural Production	36
Horticulture	18
Home Econ. Family Living	19
4-H Youth	24
Community Resource Development	3

Telelecture Program Development

Extension Specialists decide the kinds of programs that they will be willing to give by telelecture. They write up a description of each offering in Open Doors to Learning. Open Doors to Learning is a compilations of all educational offerings by Extension Specialists. It is revised yearly and provided to all County Extension staff members.

County Extension Agents request the help they need by telelecture on a request form with their annual plan of work. Counties requesting similiar program help by telelecture are scheduled to receive the program at the same date and time if possible. The number of counties receiving the same program at the same time will vary from one to twelve.

Cost. Each County Extension Office pays $50 per year to the Minnesota Extension Service for using telelecture. The Minnesota Extension Service is billed and pays for all telelecture installations, equipment rental, long distance charges, etc. The average cost is $45 per program.

Responsibilities (General). Telelecture programming is arranged by the Agriculture Extension Scheduling Office, County equipment installations and rental is arranged by Al Meister, Bell Telephone representative, Minneapolis and technical arrangements, preparation of visuals, and mailings are done by the Department of Information and Visual Aids.

County Extension Staff Responsibility

1. Learn to operate the equipment.
2. Request telelecture programs.
3. Arrange for meeting place.
4. Write publicity - brochures, notices.
5. Open the meeting.
6. Show the visuals.
7. Handle question and answer periods.
8. Lead discussion after the telelecture presentation.
9. Post publicity and follow-up.

Extension Specialist Responsibility

1. Prepare presentation.

2. Have all visuals duplicated and ready for use at least two weeks before the presentation.

3. Provide to County (2 weeks before presentation)
   a. Outline of program or disucssion guide and supporting publications.
   b. News article on the program.

4. Give presentation in room assigned by Department of Information and Educational Aids.

Scheduling Office Responsibilities

1. Make up proposed schedule of telelectures from county requests. Get approval of schedule from counties and specialists involved.

2. Provide copies of approved schedule, and revisions throughout the year, to counties, specialists, Bell Telephone Co. (Al Meister) and Department of Information and Educational Aids. (Don Breneman and technician responsible for working with telelecture.)

Bell Telephone Co. Responsibilities, (Al Meister)

1. Arrange for procurement, installation and removal of all telelecture equipment in the counties where programs are scheduled.

2. Contact Extension Agents at time of installation and prior to removal of telelecture hookup and equipment.

3. Make arrangements with the conference operator to make the necessary telephone connections for each telelecture program.

Department of Information and Education Aids (Don Breneman) Responsibilities

1. Provide and equip two rooms with microphones and 50A telelecture equipment for producing telelectures.

2. Provide a technician to work with the specialist presenting the telelecture and the telephone conference operator when the program is presented.

3. Reproduce slides sets and other visuals.

4. Mail visuals to counties at least two weeks before the telelecture program is to be given.

Evaluation

Suggestions from Extension Agents to Specialists giving telelectures.

1. Always speak directly into the microphone.

2. Try to relate yourself with the audience.

3. Use plenty of illustrations.

4. Avoid using slides with lists or detached charts.

5. Use slides as a guide to discussion rather than a discussion built around the slides.

6. Limit lecture to 20 minutes between question periods.

7. Total time of lecture and questions should never exceed 90 minutes.

8. Limit the number of counties to not over five per program.

9. Allow one or two questions from each county and then open have questions from any county.

10. Make the answers to questions short.

11. Use the persons name in replying to questions.

Evaluation by 329 Minnesota Participants in Telelecture in 1970

1. Did you like it?

Very much	109
Fairly well	195
Not at all	5

2. If another subject in which you are interested is given, would you attend?

Yes	218
No	6
Don't know	84

Extension Agent Telelecture Evaluation 1972

Subject Swine Nutrition and Health

Excellent	50%
Very Good	40%
Good	10%

Subject Fabrics

Excellent	28%
Very Good	33%
Good	28%
Fair	11%

Subject Vegetable Gardens

Excellent	44%
Very Good	56%

Subject Domestic Sewage

Excellent	64%
Very Good	46%

Subject Perennial Flowers

Excellent	64%
Very Good	36%

Research Study on Learning Results
Telelecture vs In Person Teaching
B.J. Conlin & Patrick Borich Minnesota 1972

Subject matter - "Concepts of Dairy Breeding"

The same presentation and the same post test and pretest was given to the audiences.

13 county meeting audiences received the subject matter by telelecture.

5 county meeting audiences received the subject matter in person by the same specialist.

Participants 142 farmers received the lesson by telelecture.

85 farmers received the lesson in person

Results There was no significant difference in the concepts learned between the farmers receiving the information by telelecture and those receiving it in person.

Summary

Telelecture has been used as a teaching method in Minnesota for eight years. Nearly one fourth of specialist help to county meetings is received by telelecture. The growth of the use of telelecture was rapid but has now leveled off.

The principle of the County Extension Agents developing their own plan of work and requesting specialist help is support of that plan of work has been followed. The principle that each specialist controls his own schedule has also been followed.

Evaluation was intensive during the early years resulting in changes in equipment, changes in methods of presentations in subject matters used, scheduling, and in reducing the number of counties connected on each program to five or less.

The excellent cooperation of Bell Telephone Co. (Al Meister) with the Department of Information and Educational Aids and the Scheduling Office has been an essential ingredient to the success of the program.

EDUCATIONAL TELEPHONE NETWORK:

ENGLISH FACULTY AND FOREIGN POPULATION

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In 1973 the Florida legislature mandated that foreign professionals residing in Florida be provided with one year of continuing education that would prepare them to take the Florida state licensing examination for their profession. The new law further specified that, if at least 15 of the students requested it, the continuing education course would be provided in their native language.

The University of Florida's School of Pharmacy was selected as the agency to provide the necessary education for pharmacists. Assurance of quality of education equivalent to what the American student receives was an imposing responsibility. The decision was made to adapt the one-year credit program, through which a student with a B.S. Pharmacy Degree from a foreign school could receive an accredited degree from the College of Pharmacy, to provide an equivalent educational experience through continuing education. This 43-quarter credit hour program was transformed to 43 Continuing Education Units (C.E.U.).

At the time the act was passed, over 600 graduates of foreign pharmacy schools were living in Florida--most of these graduates were Spanish-speaking Cuban exiles. Naturally, they requested that the course be offered in Spanish. This request posed an enormous challenge to the College: to provide the 430-hour program in a foreign language to a very large and geographically dispersed student group.

Many alternatives were considered. We worked with the Colegio Farmaceutico Nacional de Cuba (En El Exilio), a group that represented the Spanish-speaking pharmacists in the Miami area, to arrive at a solution that would be acceptable to the students and to the College of Pharmacy.

A major problem was the geographical distribution. Although a majority of the potential students were living in the Miami-South Florida area, significant numbers were living in Tampa, Orlando and other areas of the state. Several options were considered: one was to allow faculty members and students to travel to a central location for a weekend course. This was deemed unacceptable by the Colegio because many of the potential students worked on weekends or had family obligations. Offering the course in one location would have meant that only 200 students could be enrolled in the first year, since that was the maximum number the facilities could handle.

The students felt that an evening course would be the most convenient for them. However, the faculty could not travel three nights per week to present ten hours of instruction weekly.

For several years the College of Pharmacy had been interested in initiating an Educational Telephone Network in Florida. We had discussed the possibilities of such a network with the University of Florida's Dean of Continuing Education, Dr. Betty Siegel, and the Director of the Learning Resources Center, Dr. Neal Balanoff. The foreign graduate pharmacists program presented an ideal opportunity to develop the network. We were confronted with a real need that only the network could fill, and we had the possibility of adequate funding from a concerned, eager student population.

With the ETN all qualified students could be enrolled in the course during the first year. Listening posts could be established within easy driving of their homes, and the instructors would not have to leave Gainesville.

Curriculum development of the proposed courses took place in 1974-75, but the decision was made to delay the start of the course until the ETN could be implemented. After much discussion and clarification of the new law, we were told in September, 1975, that by the end of 1976, the first one-year course had to be completed. This meant that we had less than four months to make the network operable. Through the efforts of the Learning Resources Center and the Southern Bell Telephone Company, this was accomplished. Once the decision was made to implement an ETN, the College of Pharmacy turned its attention to devising a method of interfacing an English-speaking faculty with a Spanish-speaking student group.

How to handle the dynamics of instruction while interfacing an English-speaking faculty and Spanish-speaking population over an ETN posed a unique problem. From previous experience with audio-cassette courses, it was determined that the students' attention span was around thirty minutes. Thus, the course was designed around thirty-minute lecture modules, followed by question and answer sessions, which would be recorded for future reference on the same reel as the lecture. Four lecture modules and Q/A periods are scheduled each night.

As an additional learning reinforcement, each lecture is transcribed and printed. Each week every student receives a copy of twelve lectures and accompanying graphic handouts. Thus, the student may follow the written lecture as he listens to it over the network.

The process of converting a faculty member's lecture into a recorded Spanish lecture and handout involves twenty-two separate steps. A new office was created to handle this process. The instructor's hand-written lecture is edited and typed in English. After approval by the author, the lecture is sent to a Spanish-speaking translator. We were fortunate to have senior pharmacy students of Spanish origin who were suited ideally to serve as translators. The translation is checked for quality and accuracy by a native Spanish-speaking professor in the College. Each lecture is pre-recorded in Spanish in the LRC Sound Studio and is stored until the night it is transmitted. The lectures are sent also to the offset printers. About 300 pounds of copy are printed and shipped each week to the Jacksonville, Tampa, Orlando, West Palm Beach, Hollywood and Miami classrooms. This process is repeated for twelve lectures per week. A Spanish translator is present in the studio the night the lecture is transmitted and has a copy of the printed lectures, which are used as a reference while questions and answers are being translated for the instructor.

Responsibility for the coordination and implementation of the technical aspects of the network was delegated to the J. Hillis Miller Health Center Learning Resources Center (LRC). The first decision involved the choice of equipment. The Darome Amplified Telephone System was selected because of superior quality when multiple stations are required. The Darome system also provided synchronized slide projection capability. The Darome amplifiers and four-wire system provide a higher degree of fidelity for more comfortable listening. A voice-activated relay and limiters prevent feedback and unbearable noises.

The major problem we encountered in implementing the system on short notice was the ponderous state purchasing system. However, the Darome Company and Southern Bell Telephone of Florida cooperated to install the system as quickly as possible.

Initial technical difficulties were due either to line transmission problems or problems involved in setting up and taking down the local equipment each night. For the first week we experienced a lack of interclassroom communication; consequently, all questions had to be repeated by Spanish translators in Gainesville for the benefit of the students in other classrooms. This problem was corrected during the second week. We experienced some equipment or line failures during the first few weeks of the operation. This was quickly corrected, and the lectures that were missed were sent to the classrooms along with the recorded question and answer sessions.

The LRC designed the system to be as fail proof as possible. Each lecture is played simultaneously on two recorders, with the signal from the large reel-to-reel recording going out over the network. Should the tape break or this recorder fail, the Audio Engineer simply switches output lines and the lecture is continued from a cassette recorder at the same point. The dual system is available also for recording failures during the question and answer sessions.

The network was started with listening posts in Orlando, West Palm Beach, Tampa and ten classrooms in Miami. As the program got underway, we found that a group of students from Hollywood was driving eighty miles each night to take the course in Miami. A listening post was established for them at a hospital in Hollywood. Three students were traveling seventy miles one way from Jacksonville to Gainesville, so another post was established in Jacksonville.

The adult student learns more easily in a small group situation. We planned all classrooms with this concept in mind so that a bonding relationship would develop. The students gather to study and a feeling of camaraderie develops.

We were concerned about how this group would adjust to speaking into a microphone. At first they were somewhat restrained; the same few voices could be heard each night over the network. Now, they talk back and forth, and very few are too shy to ask questions.

Evaluation procedures termed diagnostic tests are built into the program, although the law mandated attendance as the only criterion for successful completion. These tests caused some concern when they were first proposed, but explanations convinced the students that self-assessment and evaluative feedback were essential to their learning process. Tests are computer graded and identified by a code number known only to the student. This allows us to evaluate the progress of the group as a whole, as well as the progress of individuals, even though the individuals are identified only by number.

The results of the tests show that learning is taking place! We used a 75% grade attainment for comparison, since this is a national requirement for pharmacy board examinations. Reviewing the four tests in the first course (Anatomy and Physiology), we found the entire population achieved this grade in a range from 51% to 92%.

In addition to objective testing, we have interviewed students about their course expectations and their reaction to learning via ETN. The response is a very positive acceptance of the ETN as an alternative to the traditional classroom. Some students express that ETN provides additional advantages. They have easier access to the instructor for their questions received and answered.

The Florida ETN was established to meet a specific need. Plans are underway to utilize the network for mandated continuing education requirements. Also, the College of Education is investigating the potential of ETN for credit courses. Ownership of the system will be held by the Division of Continuing Education so that all areas of the University will have access to the network. As these other programs are developed, additional listening posts undoubtedly will be established throughout the state.

We feel that establishing this course for foreign pharmacy graduates has added another dimension to the uses of the Educational Telephone Network. It is possible now to educate a large number of students in a language that the instructor cannot speak. This opens the way to education for many national groups in the United States who are unable to practice their professions because of liscensing restrictions.

HOME ECONOMICS AND TELENET: YESTERDAY, TODAY AND TOMORROW

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Demands for up-to-date information are constant. County-based staff are our frontline contacts with the public. And a major responsibility of state staff housed on the University campus is to provide in-service education to help keep county personnel abreast of techniques, technology, and theory in home economics and family development.

The Extension educational approach means that our professionals not only use a variety of methods to disseminate information, but also encourage people to adopt improved practices where appropriate. This goal necessitates in-depth, sustained educational programs by staff who understand the learning process, whose subject matter knowledge is comprehensive and who have the ability to analyze local needs. Their next step is to plan, implement and evaluate appropriate programs cooperatively with lay people serving on councils, committees and boards.

Our records show that in 1975 approximately 150 professional home economists officed in each of the 102 counties in Illinois served the informational needs of more than a half million people. Twenty-one state staff members provided intensive support as program leaders and subject matter specialists. On-going leadership and coordination for the statewide effort is provided by the Assistant Director.

Home Economics Extension programs present diverse subjects of interest to family members both at home and in community settings. By providing people with practical information and useable skills, Extension helps people help themselves.

Topics of great interest this year are:

--Nutritional impact of dietary selections
--Food preservation; canning, freezing and drying
--Many aspects of competent consumerism
--Effective family financial management, including such components as spending plans, use of credit, buying insurance and estate planning
--Understanding arthritis and other chronic diseases
--Family communications: husband-wife, parent-child, parent-adolescent
--Low cost furnishings and furniture
--Flame retardent fabrics for children's clothes

TeleNet Yesterday

TeleNet, Illinois Extension's dedicated telephone network, represents a relatively new media approach to extending the outreach potential of state staff. Our first program use of TeleNet was on November 30, 1970 when Esther Siemen, Textiles and Clothing Specialist, conducted an in-service workshop for county home economics advisers.

The fall of 1970 TeleNet in Illinois provided 17 locations distributed throughout the state. This was soon expanded to 21 units, based on multi-county administrative units. By 1973 we had expanded the general network to 26 locations. When administrative staff requested private, closed communication for administrative liaison we added a separate regional office network in 1974. This additional nine-location network primarily provided administrative liaison, but could be linked up with the other network for general program use. Later that year, Region I, the northwest corner of the state, decided to pilot a regional net. Voluntarily sharing the additional cost, each of the nine counties installed a TeleNet operation in the county office enabling them to interact as a separate regional net, or link up with the other two networks at their request.

With this expanded network, by 1973 statewide use of TeleNet by Home Economics Extension began to really catch hold. Coincidentally, the impetus for such programming came almost simultaneously from state and county sources.

Prior to the beginning of the Extension program year, July 1, county staff submitted requests for state staff presentations. In one case, the specialist in interior design who was only on 30% Extension time, was requested to conduct 18 training meetings on basic design. Since this scheduling was impossible we decided to use TeleNet to meet the need. Instead of teaching volunteers face to face, the specialist taught an intensive two-session short course for county staff and they, in turn, conducted training sessions for the volunteers.

That same spring the state staff specialists decided to offer the county staff question and answer sessions, "trouble-shooting," on a regular monthly basis. Based on comments received from the evaluation of this 1973-74 trouble-shooting sessions, we developed for the 1974-75 program year a more formalized series of up-date presentations by subject matter specialists. With the TeleNet staff, we designed a logo, developed a schedule and sent flyers announcing the series so that the county staff could schedule the presentation dates on their calendars early in the program year. Agricultural Communications TeleNet staff followed through in assisting specialists develop presentations and materials. Program evaluation, which we will discuss later, prove the worth of our joint efforts.

Meanwhile, in Region II, the populous northeastern corner of Illinois, county staff developed a plan to use TeleNet to present a series of consumer education programs entitled "Consumer Alert: Questions You Always Wanted to Ask but Didn't." Because TeleNet is a two-way telephone network prominent officials from selected government and other consumer agencies could present a program to the whole region without leaving their home base in Chicago. The eight session program developed by the Region II committee was so impressive that the TeleNet staff suggested we offer the session to the whole state.

TeleNet Today

Today the Illinois TeleNet system consists of 48 locations with three sub-systems which can be utilized independently or joined together to form one large network as needs dictate. The three sub-systems are the regional office administrative network, mentioned above; a network connecting the region one Extension offices; and an expansion of the original basic network established with 17 units in 1970.

TeleNet is accepted as a media method by most of the Cooperative Extension Service staff. As such, its potential is routinely explored as an available alternative for program delivery. Just as with other media methods it has strong supporters--and detractors. Whether professionals or lay persons, some individuals embrace the new and others shun it. Some early experimenters enjoyed the adventure, while others, who shared in our growing pains era, do not share in our spirit of adventure and don't want to run the risk of another unsatisfactory experience. Unfortunately, even where problems were relatively minor and compensated for on the spot, staff tend to remember the specific negative incident rather than the generally satisfying overall program and generally positive audience feedback.

We were successful in promoting the use of TeleNet for subject matter update for county staff because the total state staff in home economics and family development made a commitment to utilize this media to maximize the output of their small numbers. The only other alternatives providing immediate interaction with the audience require travel to several meetings with comparably greater expenditure of staff time, budget and energy.

The Assistant Director provided behind the scene support for the TeleNet decision by assigning her associate to tabulate results from the previous year's survey and reporting results at the state staff meeting. To expedite the decision-making process the Assistant Director drafted a proposal for use of TeleNet for a subject matter update series and assigned the chairman of the specialist group (a rotating three month leadership role) to convene a meeting to discuss the proposal and make recommendations. At the next staff meeting those recommendations were reviewed, slightly revised and accepted.

Fortunately, additional assistance was made available in 1974-75 from agricultural communications for support of home economics Extension TeleNet presentations. The TeleNet communications specialist was able to assume responsibility for coordinating details, scheduling presentations and developing descriptive brochures. She was also available for consultation on supportive materials, program delivery approaches and audio visual enhancement appropriate for use with TeleNet audiences. The communications department and home economics Extension also agreed on how to share the cost of producing such materials.

At the conclusion of the TeleNet update series we mailed a questionnaire to get feedback from the county staff. This brochure carried the same logo as the original update announcement, but was in a different color. The summary of results indicated a very successful year, and strong support for conducting a similar series in 75-76. We have tried to incorporate into this year's program several suggestions for overall improvement from last year's evaluation. For example, we are helping specialists to prepare packets which can be provided directly or loaned to counties for county staff use for local programs based on TeleNet update sessions. The weekly news packet mailed from the University to county staff contains TeleNet reminders, easily identified by both the TeleNet and home economics update logos.

The packets prepared in support of the 1975-76 TeleNet update series were planned for immediate support and flexible adaptation to county program follow-up or other alternate use. Our goal is to provide low cost multiple use materials.

To introduce each update program a one page sheet is prepared to give the program title, time schedule and a photo of the presenter--all run off on a copy machine. The quality of this product does not compare to offset printing, but is adequate for this in-house use intended for people who have already met the presenter. This is a reminder, not an introduction, and it works well for our purposes to help facilitate communication.

Visuals for TeleNet use may be original paper artwork for overhead transparencies (which can be reproduced as transparencies locally if desired), actual transparencies, slides, printed materials or actual product samples. Since materials must be available at each site where participants have indicated attendance, expense of visuals is always a factor to be considered.

TeleNet is sometimes used to introduce materials available for statewide use. If a limited number of packets is available; e.g., perhaps one per region, then paper illustrations and sample slides are used for the TeleNet audience. Those interested in using the total packets for their programs may then request them on a loan basis. If the materials being introduced include a slide set or cassette tape, 4 or 5 slides are provided to the TeleNet audience as a teaser and portions of the tape are played as part of the TeleNet program presentation.

During a TeleNet presentation of specialist developed materials explaining the rationale behind the nation's move to metrics, many advisers requested further help with teaching metrics. To help answer these needs a course for academic credit, "Teaching Techniques for Metrics" was arranged with the University of Illinois extramural extension to be delivered via TeleNet. Both Extension advisers and public school teachers participated in this twelve week series. The evaluation confirmed that TeleNet was considered an effective way to deliver the course, and the students requested more opportunities to earn credit via TeleNet.

One of the most unique uses of TeleNet this year was a two-county workshop teaching how to make visuals. The audience consisted of county professional staff and paraprofessionals in the Expanded Food and Nutrition Education Program. An agricultural communications artist and instructional media specialist developed the program in cooperation with a special programs instructor from home economics and family development. This topic was so "visual" people thought it couldn't be taught via TeleNet. Yet the response proved the contrary, and emphatically.

During the current program year a number of committee meetings and conferences have been conducted via TeleNet. This practice has saved both travel time and costs for participants. With TeleNet, committees have been able to include members from the far corners of the state where previously this would not have been feasible.

Critical Points. How is TeleNet working? Equipment is improving, service is becoming more reliable and programming is increasing, but as we said earlier, TeleNet has its supporters and its detractors among presentors. It also has proponents and antagonists within the audience. Principal complaints from the audience involved travel to the TeleNet site and location of the TeleNet equipment in the county office.

Presently there is a TeleNet site within 50 miles of each county office. However, those who travel the total distance must allow travel time to the site in the day's schedule. We have lessened the scheduling impact by planning several presentations on each day to make devoting a day to TeleNet more economical in terms of travel demands.

In some county offices the TeleNet conference unit has been plugged in the office area assigned to some other staff member. If that staff member was not participating in the particular TeleNet presentation, those who were participating felt uncomfortable about interfering with the other's office routine, phone calls and visitors. Hopefully, this situation has been corrected.

We have located three or more sites in each county office complex including at least two staff members' offices in each location. We have also consulted with county staff as to the most appropriate placement of the TeleNet equipment eliminating many problems in both areas.

TeleNet is frequently being used for committee meetings and inter-county communications. When all networks are open TeleNet is like a super revival of the old party line telephone--with some of its hazards. Confidentiality is difficult to insure. Also, when parties in a conversation pause or there is silence for a work period, an unrelated party can tune in, hear only silence, and assume no one else is on, and call for his desired contact. On planned programs this problem is avoided by playing background music during extended pauses. Naturally, programming for such a large system must be systematically scheduled. This scheduling allows spontaneous communication in open periods.

TeleNet Tomorrow

We are currently exploring the feasibility of every county office having its own TeleNet unit in 1976. We trust the increased convenience of access will augment the use of TeleNet and therefore justify the increased cost. We will also be replacing the currently used 50A Conference arrangements with improved models, the 50A-1, or with Darome units which offer much improved sound quality in transmission. Both of these amplifying systems are currently being field tested by county staff. We anticipate gradually increased use of the TeleNet systems ending only when capacity scheduling is achieved.

Potential Uses. Current TeleNet programming is minimal but we expect to continue expansion of programming. Suggestions to help improve TeleNet use made by county staff in home economics and family development include:

1. Pending legislation whenever appropriate.
2. Continue giving new information that is pertinent to home economic advisers' current programs.
3. Give information about up-to-date research to help give new direction and new ideas for programs.
4. Present some mini-courses.
5. Send samples or case histories to help stimulate discussion and participation.
6. Give opportunities to share ideas and program suggestions.
7. Offer courses for graduate credit.
8. Send addresses and complicated reference sources in a written form.

Through the leadership of the Assistant Director the state staff is considering the following suggestions for using TeleNet:

1. Deliver a series of meetings on a related topic with personal appearances from alternative delivery sites.
2. Plan update sessions on special interest topics using dial-up hook-ups and plug into the TeleNet capability to call the experts in the field.
3. Use TeleNet to repeat successful programs. Have original presentation taped and duplicate supportive materials. Tape can be repeated as often as field staff interest warrants it. A live question and answer period can be planned to supplement taped session.
4. Use TeleNet for statewide committee meetings to save travel time and cost.

TeleNet can be used to provide basic and essential program components. However, it can also be used for special items we would otherwise have to class as unaffordable program enrichment.

Hurdles to Overcome. The Hawthorne effect--whereby anything new or different seems preferable to the old--has worn off. We are at a plateau stage in TeleNet programs in home economics and family development.

In the paper, "Research on Purposive Communicators: An Evaluation Model" submitted to the 1973 Association for Education in Journalism at Fort Collins; Colorado, Olien, Donohue and Tichenor approached evaluation from within a systems framework that included source, channel and the ultimate audience. We have not attempted a comparable evaluational profile since our evaluations have been planned to provide feedback from the audience. However, if we were to make an educated guess as to levels of satisfaction experienced we would rank them in the following order: channel, ultimate audience, source.

The channel best understands the TeleNet medium and is most tolerant of its imperfections and limitations. The ultimate audience is thirsty for current subject matter and program information and will support any and all delivery systems. The source is critical of the quality of its own presentation techniques, the technology of the TeleNet medium and extremely sensitive to any negative feedback from the ultimate audience.

Problem	Actual and/or Proposed Solution
Travel distance	TeleNet in each county office.
Access to TeleNet Equipment	Consultations with Agricultural Communications staff as to best placement.
Scheduling	Flyers listing entire update series mailed early in the season. Additional TeleNet dates, promotional descriptions and reminders sent with weekly news packet using logos for easy identification.

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Topic Selection	County staff requests for specialist assistance, national trends and issues, and research findings serve as basis for presentation topics
Availability of TeleNet Support Material	TeleNet specialist assisting state staff in the selection and preparation of appropriate visuals One audience member identified in advance to serve as coordinator for the receiving center to distribute materials and operate visual equipment
Determining effectiveness of programs	Planned evaluation for feedback
Improving quality of presentations	Installation of improved equipment in TeleNet sites TeleNet training sessions for presentors Soliciting informal feedback for presentors from ultimate audience, source and administration as well as encouraging self and peer evaluation

Administrative Support. Whereas any state staff in home economics and family development would likely have some members enthusiastic about TeleNet, coordinated substantial usage is unlikely to occur without sustained administrative support. State staff tend to be strong individuals each with a specific area of expertise. Research and theory are more often departmentalized than interdisciplinary. Effective state staff must be highly motivated and self-disciplined, able to initiate and implement programs, able to innovate, convince and exhort as necessary. It takes a great deal of persistance and human relations skill to lead state staff to select TeleNet as a media approach. However, democratic selection generates far greater acceptance and willingness to work at high quality than administrative fiat.

The Assistant Director for home economics and family development is convinced that TeleNet can effectively extend the outreach of a limited number of state staff. The actual budget savings for travel costs depend on costs of visuals and other support materials.

However, even if the dollar cost is the same, staff time is used more effectively because more audience members are reached and time on the road is reduced.

In both 1973-74 and 1974-75 we conducted evaluations of update sessions. There was no attempt at formal evaluation of conference and committee work, however, many successful happenings and informal comments suggest satisfaction.

Although our knowledge tests for the ultimate audience, have been limited to short motivational pre and post tests during the program, we are confident that the 1972 HEW project reports apply to Illinois. Hoyt and Fryre conducted a study of "The Effectiveness of Telecommunications as an Educational Delivery System." They concluded that "telelecture instruction and standard classroom instruction were equally effective as educational delivery systems when measured from the instructors frame of reference...When success was measured from the students frame of reference telelecture was at least as effective as on-campus instruction...Students who profited most (from the telelecture system) exhibit more personal independence, a higher degree of motivation, and a greater "openness" to the learning situation...Students who gained most exhibited confidence in themselves, a higher degree of self-responsibility.

Confidence in research findings takes us one step further. McLuban's theory of media proposes that sensory limitation of input information from any one medium is completed by internal arousal of complementary sensory responses. Therefore, while we encourage presentors to provide visual as well as verbal stimuli, the ultimate audience is, of its own accord, elaborating on our efforts.

In a paper presented to the 1973 AECT Convention in Las Vegas, Nevada, Charles Hoban proposed three major hypothesis for mass communication:

1. The hypodermic needle hypothesis: Messages enter directly into the bloodstream of cognition, affection, and conduct.
2. The reinforcement hypothesis: Messages reinforce existing tendencies or structures of our three domains and initiate patterns of behavior only if no prior pattern exists.
3. The cultivation hypothesis: Messages and message systems cultivate our priorities, our values, our patterns of perception and expectation, and our very grounds of reality.

Hoban preferred the latter.

We suggest that all three operate simultaneously to some degree. We believe that messages do enter the cognitive "bloodstream" upon reception. However, our experience indicates that affective and conduct change come later, if at all. Reinforcement influences cognitive, affective and conduct patterns and can operate to modify behavior even where contradictory prior patterns exist. Cultivation is but a refinement of the former.

Because of our conviction that media messages can be effective and that TeleNet is a medium well-suited to our needs, we anticiapte continued and expanded use of TeleNet for in-service education for county staff and for program presentations directly to the ultimate audience. The ultimate audience--our clientele--has already indicated sufficient positive response to prove acceptability of TeleNet.

Retraining Emergency Medical Technicians
Via Telephone Conferences

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Although the Department of Continuing Medical Education of UW-Extension has used telephone conferencing for ten years, we are still discovering its adaptability to meet specialized requirements in continuing education. The most recent involves a series of programs for Emergency Medical Technicians, a group of non-professionals who are responsible for immediate care of sick and injured people and their transportation to professional care.

This group, which numbers approximately 4,000 in Wisconsin, completed a basic 80-hour course of formal training. However, little provision had been made for their continuing education. In doing so, there were some special problems to consider: (1) They have varying educational backgrounds, but generally do not normally participate in continuing education, (2) Cost is a critical factor, since they are mostly volunteers at medium or low income levels, and (3) Many have full-time jobs unrelated to their EMT responsibilities, and are not free to leave their communities for continuing education.

The department was experienced in working with EMTs. For the past eight years we have presented a week-long Summer course aimed at updating knowledge and maintaining skill proficiency. Average attendance has been about 140. However, with the initiation of the basic 80-hour course, the number of EMTs increased dramatically, and conferencing is no longer suitable for dealing with the present volume of EMTs requiring continuing education.

Consequently, in early 1975, a pilot series was presented over the Educational Telephone Network to determine: (1) If the medium was acceptable to the EMTs, (2) If the cost of such programming was reasonable, and (3) If the system offered a convenient medium, in terms of travel distance.

Fifteen counties were selected for the experiment and notices were sent out to 109 ambulance service operators. A series of four programs, each two hours in length, were available at 22 listening stations in the selected counties. The programs were presented, and evaluated by means of a questionnaire completed and returned by each participant at the conclusion of each session.

The key question, in relation to the acceptance of the programs was: "Were you introduced to any information that will be useful to you in your role as an EMT?" Of the 529 who responded, 97% answered, "Yes."

Concerning convenience, participants were asked: "From a travel standpoint, was the program presented at a location that made it convenient for you to attend?" Of the 513 who responded, 96% answered, "Yes."

Measuring cost effectiveness was a bit more complex. All costs, except for that of the volunteer faculty, were carefully documented. Total costs were then computed for each student, and for each individual hour of instruction, as follows:

	Total	Per Participant
Coordinator - 240 hours @ $5.53	$1,327.20	1.73
Secretary - 48 hours @ $3.71	178.08	.232
Slides - 3,287 @ $.21	690.27	.899
Outlines -	38.40	.05
ETN Circuit Time - 8 hours @ $100	800.00	1.043
Postage - 76 Cartons @ $.18	13.68	.017
Totals	$3,047.63	3.971

Since the cost per participant is for eight hours of programming, cost per hour for each participant is approximately $.50.

The conclusions we have drawn from the above, which are supported by other data from the questionnaire, are:

1. Telephone conferencing is an acceptable medium for retraining of EMTs.
2. Such programming is cost effective.
3. The medium is convenient in terms of travel time involved for participants.

As with most experiments, we learned a few things that had not been anticipated. One involves follow-up publicity. When the initial mailing resulted in only 230 registrations, a second mailing was prepared, using a different colored form. This resulted in 153 additional registrations.

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This experiment has given significant direction to the department in its planning of EMT retraining. At present, we are completing planning of a second series to be presented over the ETN. However, past experience indicates that the medium is not as effective in maintaining skill proficiency, and consequently discussions are being held with the Vocational, Technical and Adult Education system to determine if a partnership can be formed whereby maintenance of knowledge levels is accomplished through a statewide ETN approach and retraining in skills can be carried out through workshops at the community level.

The Summer course will also be continued for the next few years since it is filling a need for certain EMTs and others involved in emergency care in such settings as industry and hospital emergency rooms.

Still another methodology, provision of audiovisual materials for independent study, will also be explored. It is expected that a rental library of such materials will be useful to the VTAE instructors at the community level, and to individuals who find independent study preferable to ETN programs and community workshops.

Since the VTAE system in Wisconsin now has responsibility for the basic training of EMTs, and will be presenting the 80-hour course to expand the number of qualified EMTs and provide replacements for those who drop out of local services, that system will eventually assume major responsibility for their continuing education.

However, all indications are that the ETN will remain a major component of such a program. It provides access to and efficient use of a highly qualified physician faculty and a low-cost method of reaching large numbers of EMTs.

UTILIZING TELECONFERENCING FOR MUSIC EDUCATION

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By utilizing a communications system like the University of Wisconsin Extension Educational Telephone Network (ETN) music education can venture into new frontiers of programming which have tremendous potential. Adult and extension music education can now have a state-wide impact which the traditional and conventional forms of delivery, such as local, regional and state workshops and classes, can never achieve. Further, such a communications system makes it possible to achieve programming involving internationally celebrated artists and universally acclaimed authorities which can be afforded in no other way.

University of Wisconsin-Extension has a long and distinguished history of bringing continuing education opportunities to the citizens in all regions of the state. Today the four and a half million Wisconsin residents are concentrated in the southeastern quadrant of the state with the rest dispersed throughout a moderately large state -- 350 miles from north to south and 250 miles from east to west. Through the years conscious efforts have always been made to bring music offerings to all regions of the state. Rising travel and salary costs caused exploration of a communications system as an option for state-wide service. Because music is an aural art, a communications system seemed worthy of exploration and experimentation.

Initially in Wisconsin the first venture in music using this communications system was for the continuing professional education needs of private piano teachers. For a number of years the University of Wisconsin-Extension Music Department had been presenting various types of workshops throughout the state for piano teachers. In designing the first offering using ETN an effort was made to appeal to three levels of piano instruction: elementary, intermediate and advanced. The personnel selected to present these topics all were widely known and respected. An international concert star was used for the advanced level. This first venture as well as the three following offerings for piano teachers are outlined in Table I Sections A, C, G and J.

Spurred by the positive results from the first offering for piano teachers, six months later a series of three seminars for the spinet organ teacher was scheduled. There had been no previous programming by the University of Wisconsin-Extension Music Department for spinet organ teachers as had been with the piano teachers. However, this area of music had been under consideration for some time. It was finally motivated by the trends in the keyboard industry. In 1973, unit sales of electronic organs exceeded piano sales in the United States for the first time in the history of the keyboard industry. In Table I Sections B, D and H, the efforts for spinet organ teachers are described.

In 1973, a law in Wisconsin was adopted which established the concept of mainstreaming, whenever possible, children with learning disabilities into regular classroom situations. The Consultant in Music for the Wisconsin State Department of Public Instruction approached the University of Wisconsin-Extension Music Department for assistance in developing a program to prepare music teachers to better cope with classes including mainstreamed children. ETN was proposed as a means to achieve as broad a state-wide coverage as possible. The offering, "Music and the Exceptional Child" was the first time any programming for school music educators was attempted on this system (See Table I Section E).

The next step in using this communications system was again in response to a state law. This time it was a law mandating each school district to file a music curriculum with the Wisconsin State Department of Public Instruction. As a result of the program described in Table I Section F it was possible for the Consultant in Music for the Wisconsin State Department of Public Instruction to assist almost 100 school districts in their curriculum development. This meant he was reaching almost 20% of the school districts in the state. If he had visited them individually it would have taken him almost four months of devoting his time exclusively to this issue.

The most recent utilization of this communications system is for a year-long, comprehensive program for music educators. The attempt in this offering is to meet a variety of needs of a variety of school music teachers in two or three session segments throughout the course of the year. Each segment is considered by itself and each segment is promoted individually. The two earlier offerings for music educators ("Music and the Exceptional Child" and "Curriculum Planning for Music Education") just barely introduced the music educators in Wisconsin to the potential a communications system like ETN has for them. This series is outlined in Table I Section I.

Only through a communications system like ETN can the wealth of talent and expertise which have been programmed be available to Wisconsin, let alone with such state-wide impact. For the international concert star a system like ETN makes it possible to make presentations from his or her home or hotel room when on tour. Such convenience makes this caliber of talent more willing to share their artistry with educators. Likewise, persons of expertise like college presidents and heads of prestigious national associations could not afford blocks of time for several days of appearances in various regions in the state to achieve maximum state-wide coverage. Travel costs and honoraria would be prohibitive.

With each person used to date giving a presentation on a communications system like ETN was a new experience. Both artists and educators sometimes had simultaneous reactions of intrigue, reluctance, fascination and apprehension. Yet the convenience factor of eliminating travel and giving the presentation from wherever one was in the country was most appealing. By carefully explaining the system, however, and stressing the two-way communication dimension, these people have been persuaded to venture into this new experience.

The most unsettling factor, initially, is not being in the presence of an audience. Most musicians in a teaching situation like to see the response of an audience or class to their presentation. However, once the questioning and discussion develops, the tremendous potential of this system is realized. Sharing tape recordings of previous ETN music programs to study often greatly assists persons who are having their initial experience on this system.

The technique of sending materials to registrants is used whenever this can assist a presentation. In essence this is what one would normally use on a blackboard or overhead projector or pass out with a bibliography. Referring to this material saves time, rather than slowly reading a bibliographic source. Every minute is precious; using the time for discussion and questioning with the authorities is of prime importance since it utilizes the two-way communication dimension of this system.

The quality of music transmitted over this system is of amazing fidelity which provides for tremendous possibilities for demonstration purposes. Subtleties of nuance and phrasing of piano and organ demonstrations are easily perceived. Because of this capability, international concert artists now become available for master class presentations. In essence this was the approach of Eugene Istomin in his presentation of the Beethoven Piano Sonata Opus 53, the "Waldstein", in 1974 and of Eugene List in his presentation of the Beethoven Piano Sonata Opus 10 Number 3 in 1975. In 1976 a chorus of 34 boys was used from Copley, Ohio to demonstrate the varying qualities and ways of handling the boy's voice in its stages from unchanged, through changing to changed states. (See Table I Section 1-5.) Pre-recorded tape inserts of choral performances have shown varieties of choral styles and performance practices in choral and vocal music. (See Table I Section 1-6.)

One of the greatest challenges in introducing this system to music educators and private music teachers is to overcome the idea that this is a "radio" program. Constantly there is a stressing that ETN is a two-way communications system and that participants should take advantage of the resource people for their own individual needs and concerns. While some participants are the only person at their ETN listening location, it is stressed that they are actually in a large state-wide classroom that's linked together electronically. Of course, in any regular classroom situation not everyone enters into discussion, but encouraging discussion has been a constant factor in these presentations. To achieve more discussion, program leaders are advised to present a ten or fifteen minute segment of material and then solicit questions and discussion rather than wait until the end of a ninety minute lecture. The immediacy of involvement is necessary to counter the "radio program syndrome".

To date this author has served as moderator for each series. At times the technique has been used of calling upon several people who are enrolled at various locations in the state to gain a feeling of involvement and creating a group feeling. Some people have stated that this is embarassing. As an alternative, names of registrants around the state are mentioned by the moderator in the introductory comments, all in an effort to have persons who are alone at these listening stations to feel part of a group in this state-wide classroom. At times it has been necessary for the moderator to stimulate discussion, but every effort is made to avoid this. Another aspect which is very carefully avoided is not conducting an "interview" program, especially with the celebrities. The emphasis is always one of pursuing the announced educational objectives for the session.

There is much to be said for the moderator being in the presence of a concert artist. This presence eases disturbing feelings of not seeing this large class widely dispersed over a state half a continent away.

In the initial year, communications engineers took the equipment to the site of the program origination. In 1974, with more simplified equipment, this author was able to install it and thus be in the presence of the artist. In 1975 the microphone installation was further simplified and so it became possible to send the equipment to both Florida and Ohio for these persons to attach this equipment to their telephone jacks by themselves. (See Table I Section H and I-5.) This development eliminated the costly travel factor of this author going those distances from Wisconsin. It should be noted that this author had had previous contact with these two persons so rapport had been established and moderating from Madison was a possibility. These two successful experiences have shown it is possible for a person unfamiliar with the equipment to install it in his or her telephone jack. In these days of budget constraints it adds another aspect of flexibility. However, for successful programming one should not eliminate going to a celebrity if it is felt this presence will draw more from the individual.

The greatest challenge, not yet met in Wisconsin, is to inform people interested in music of just what ETN is and to encourage them to avail themselves of the programming. While ETN is ten years old in Wisconsin, most people still do not know about it or understand it. Of course, associated with this is the entire factor of motivating adults and professionals to participate in adult and professional continuing education opportunities. A seperate brochure has been developed for each individual offering and sent to various mailing lists of the clientele groups. Direct mail has been the key factor in informing persons of the piano series. An advertisement (See Table III) was taken in the state music education journal in the August 1975 issue to give an overview of the year's offering. News releases and radio interviews are also other techniques. See Table II Section J for the relative effectiveness of these avenues of promotion. To date only three articles in national music journals have appeared on using a communications system for music education (See References).

In Table II there is information from a survey of the participants in the 1975 Piano Teachers Forum. In Section N the time of year preferred for such an offering indicated spring and fall as desirable times. As would be expected, the morning hour was preferred, substantiating the well-known fact that most private teaching is done late afternoons and evenings. Monday was the most popular day of the week. It also is apparent that a series of three sessions with a maximum fee of $12.00 for the series is preferred by piano teachers.

The results of the survey in Table II further point out that 81% of the enrollment attended all three sessions in the series and that 67% were attending an ETN offering for the first time. The state-wide impact of a communications system is documented in that the 1975 enrollment had at least one piano teacher in 69% of the counties in the state.

As music programming has developed, advisory and planning committees were requested from state professional music organizations in order to get as much sense of need and interest from the potential registrants. The Wisconsin Music Teachers Association, an affiliate of the Music Teachers National Association, appointed an advisory committee to give guidance on program directions and emphases for the piano and spinet organ sessions. The programs for music educators have been presented in cooperation with the Wisconsin State Department of Public

Instruction; these offerings have also been presented in association with two professional education associations in the state, The Wisconsin Music Educators Conference and The Wisconsin School Music Association, both of which have appointed advisory committees. Participants in each program are invited to evaluate the offering. This information is now also used in planning of new offerings.

The potential of a communications system like the University of Wisconsin-Extension Educational Telephone Network (ETN) is just being scratched. As more listening stations are opened throughout Wisconsin, this medium for adult and extension education will become more convenient and more attractive to more and more citizens. Special emphases for youth need to be developed as well as appealing to more segments in the music world. The nation's and the world's greatest talent and thinking in music are now available to every region and far corner of the state because of the wonders and marvels of the electronic age.

References

1. Raccoli, Susan. "Technology Makes the Workshop Scene", Clavier, March 1974 Volume 13 Number 3, pages 31-33.
2. Hugdahl, Edward O. "A Communications System Serving the Continuing Education Needs of the Private Piano Teacher", American Music Teacher, February-March 1976, Volume 25 Number 4, pages 27-29.
3. Hugdahl, Edward O. "Wisconsin's Wired For Organists", Hurdy-Gurdy, January-February 1976, Volume 4 Number 1, pages 26-27.

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TABLE I

CHRONOLOGICAL LISTING OF MUSIC OFFERINGS PRESENTED ON THE UNIVERSITY OF WISCONSIN EXTENSION EDUCATIONAL TELEPHONE NETWORK BY THE UNIVERSITY OF WISCONSIN EXTENSION MUSIC DEPARTMENT - SPRING 1973-SPRING 1976

A. PIANO TEACHERS FORUM

For: Private Piano Teachers

Mon. April 30, 1973	10:00-11:50am	David Carr Glover Nationally known piano pedagogue, lecturer, composer	Portsmouth, Virginia *
Mon. May 7, 1973	10:00-11:50am	Gina Bachauer Internationally celebrated concert artist	Detroit, Michigan *
Mon. May 14, 1973	10:00-11:50am	John Perry Prof. of Music, Univ. of Texas, Concert Artist, Master Teacher	Austin, Texas *

B. SEMINARS ON TEACHING THE SPINET ORGAN

For: Private Organ and Piano Teachers

Two Mons., One Thur. Oct. 29, Nov. 5, 15, 1973	10:00-11:50am	Tom Thompson Nationally known popular concert organist, composer, teacher	Sacramento, California *

C. PIANO TEACHERS FORUM

For: Private Piano Teachers

Mon. April 15, 1974	10:00-11:50am	Maurice Hinson Prof. of Music, Southern Baptist Seminary, national pedagogue	Louisville, Kentucky *
Mon. April 22, 1974	10:00-11:50am	Adele Marcus Julliard School of Music, celebrated Master Teacher	New York, New York *
Mon. April 29, 1974	10:00-11:50am	Frances Larimer Assoc. Prof. of Music, Northwestern Univ., Group Piano Specialist	Evanston, Illinois *
Mon. May 6, 1974	10:00-11:50am	Eugene Istomin Internationally celebrated concert artist	New York, New York *

D. SEMINARS ON TEACHING THE SPINET ORGAN

For: Private Organ and Piano Teachers

Two Mondays Nov. 4 and 11, 1974	10:00-11:50am	Gerald Borsuk Professional jazz musician and teacher	Madison, Wisconsin *

E. MUSIC AND THE EXCEPTIONAL CHILD

For: Elementary and Secondary School Music Teachers Having Students With Varying Learning Disabilities Mainstreamed Into the Regular Class Groupings

14 Mondays Sept. 16-Dec. 16, 1974	6:30-7:50pm	Leo Muskatevc Prof. of Music & Head of Music Therapy at UW-Milwaukee & Past President of National Association of Music Therapists	Milwaukee, Wisconsin *

F. CURRICULUM PLANNING FOR MUSIC EDUCATION

For: Music Educators, Curriculum Coordinators, and School Administrators Responsible for Developing a Music Curriculum for a School System

Mon. March 24, 1975	8:00-9:30pm	Michael George Music Consultant, Wisc. State Dept. of Public Instruction	Madison, Wisconsin *
Mon. March 31, 1975	8:00-9:30pm	George Neaderhiser Music Consultant, Kansas State Dept. of Education	Topeka, Kansas *
Mon. April 7, 1975	8:00-9:30pm	Michael George	Madison, Wisconsin *
Mon. April 14, 1975	8:00-9:30pm	Michael George	Madison, Wisconsin *

G. PIANO TEACHERS FORUM

For: Private Piano Teachers

Mon. April 28, 1975	10:00-11:50am	Joseph Rezits Prof. of Music, Indiana Univ., Widely acclaimed pedagogue	Bloomington, Indiana *
Mon. May 5, 1975	10:00-11:50am	Ron Elliston Asst. Prof. of Music, Univ. of Maryland, Jazz Artist & Teacher	Bowie, Maryland *
Mon. May 12, 1975	10:00-11:50am	Eugene List Internationally celebrated concert artist	Rochester, New York *

H. SEMINARS ON TEACHING POPULAR ORGAN

For: Private Organ and Piano Teachers

Three Mondays Oct. 13, 20, 27, 1975	10:00-11:50am	Mildred Alexander Nationally known popular concert organist	Naples, Florida *

I. SERIES FOR ELEMENTARY AND SECONDARY SCHOOL MUSIC EDUCATORS

*Town from which offering originated

TABLE I (continued)

1. Music Administration and Supervision

For: Music Administrators and Heads of School Music Departments

Wed. Sept. 10, 1975	6:30-7:50pm	Ray Robinson President, Westminster Choir College	Princeton, New Jersey *
Wed. Sept. 17, 1975	6:30-7:50pm	Robert Klotman Prof. of Music, Indiana Univ. Pres., Music Educators National Conf.	Bloomington, Indiana *
Wed. Sept. 24, 1975	6:30-7:50pm	Rhoderick Key Chairman, Dept. of Music, Eastern Illinois University	Charleston, Illinois *

2. The Wind Ensemble in the High School Music Program

For: Band and instrumental music directors

Wed. Nov. 5, 1975	6:30-7:50pm	Eugene Corporon Conductor, UW-Madison Wind Ensemble & Symphonic Band	Madison, Wisconsin *
Wed. Nov. 12, 1975	6:30-7:50pm	H. Robert Reynolds Director of Bands, University of Michigan	Ann Arbor, Michigan *
Wed. Nov. 19, 1975	6:30-7:50pm	Stanley DeRusha Director of Bands, University of Wisconsin-Milwaukee	Milwaukee, Wisconsin *

3. Ideas for General Music

For: Elementary School music teachers and classroom teachers

Mon. Nov. 24, 1975	6:30-7:50pm	Virginia Watson Music Supervising Teacher, Milwaukee, WI Public Schools	Madison, Wisconsin *
Mon. Dec. 1, 1975	6:30-7:50pm	William Schmid Asst. Prof. of Music Education, UW-Milwaukee	Milwaukee, Wisconsin *
Mon. Dec. 8, 1975	6:30-7:50pm	Joan Davies Junior High School Music Teacher, Kenosha Public Schools	Kenosha, Wisconsin *

4. Careers and Career Education in Music

For: High School Music Teachers and Counselors

Wed. Jan. 7, 1976	6:30-7:50pm	Richard Pettibone Coordinator of Music, Janesville Public Schools	Janesville, Wisconsin *
Thurs. Jan. 15, 1976	6:30-7:50pm	Arthur Walker President, Walker Music, Inc., Milwaukee, Wisconsin	Fort Lauderdale, Florida *

5. Boys Can and Want to Sing

For: Elementary and Junior High School Music Teachers

Tues. Jan. 13, 1976	6:30-7:50pm	Kathleen Nolan Music Teacher, Copley, Ohio Junior High School	Copley, Ohio *
Tues. Jan. 20, 1976	6:30-7:50pm	Kathleen Nolan	Copley, Ohio *
Tues. Jan. 27, 1976	6:30-7:50pm	George Bragg Founder of the World Famed Texas Boy Choir	Fort Worth, Texas *

6. Choral Concepts

For: Junior and Senior High School Choral Directors

Wed. March 10, 1976	6:30-7:50pm	Elaine Brown Prof. of Music, Temple Univ., Dir. Singing City Choirs of Phila.	Philadelphia, Pennsylvania *
Wed. March 17, 1976	6:30-7:50pm	Charles Hirt Head of Choral and Church Music Depts., Univ. of Southern California	Seattle, Washington *
Wed. March 24, 1976	6:30-7:50pm	Russell Mathis Prof. of Music, Univ. of Okla., Pres.Am. Choral Directors Assoc.	Norman, Oklahoma *

7. Issues for College Music Education Majors

For: Collegiate Junior and Senior Music Education Majors

Two Wednesdays March 31, 1976, April 7, 1976	6:30-7:50pm	Michael George Music Consultant, Wisc. State Dept. of Public Instruction	Madison, Wisconsin *
		Richard Gaarder Executive Secretary, Wisc. School Music Association, Madison	Madison, Wisconsin *
		Ralph Houghton Dir. of Music Ed., Kenosha, WI Public Schools and Past-President, Wisc. Music Educators Conference	Kenosha, Wisconsin *

J. PIANO TEACHERS FORUM

For: Private Piano Teachers

Mon. April 26, 1976	10:00-11:50am	R. Fred Kern Piano Instructor, Northwestern Univ., Evanston, Illinois	Chicago, Illinois *
Mon. May 3, 1976	10:00-11:50am	Elvina Truman Pearce Acclaimed private piano teacher	Naperville, Illinois *
Mon. May 10, 1976	10:00-11:50am	Jack Radunsky Prof. of Music, Oberlin Conservatory & Cleveland Institute of Music	Oberlin, Ohio *

*Town from which offering originated

TABLE II

SURVEY OF PARTICIPANTS IN THE 1975 PIANO TEACHERS FORUM VIA ETN - APRIL 28, MAY 5 AND 12, 1975

(Based on a 42% return - 73 program evaluations of the 172 enrollees)

A. Age Range

20 - 25	1%
26 - 35	15%
36 - 45	36%
46 - 55	27%
56 - 65	0%
Over 65	0%
Omitted	21%

B. Gender

Female	90%
Male	5%
Omitted	4%

C. Highest Educational Level Attained

High School	4%
Some Conservatory Training	5%
Conservatory Diploma	7%
Some collegiate study	19%
College Bachelors Degree	58%
College Masters Degree	1%
Post Masters Degree Study	3%
Ph.D Degree	0%
Omitted	1%

D. Instruments Taught

Piano Only	62%
Spinet organ only	1%
Console organ only	1%
Organ and piano	18%
Spinet and console organ	0%
All three	16%
Omitted	1%

E. Years of Teaching Piano

None	0%
1 - 5	14%
6 - 10	21%
11 - 15	22%
16 - 20	16%
21 or more	23%
Omitted	4%

F. Years of Teaching Spinet Organ

None	71%
1 - 5	8%
6 - 10	4%
11 - 15	5%
16 - 20	4%
21 or more	1%
Omitted	5%

G. Years of Teaching Console Organ

None	67%
1 - 5	11%
6 - 10	7%
11 - 15	1%
16 - 20	5%
21 or more	4%
Omitted	4%

H. Membership in Professional Organizations

Wisconsin Music Teachers Association	12%
Wisconsin Music Educators Conference	1%
Wisconsin Federated Music Clubs	7%
American Federation of Musicians	1%
Other organizations	23%
Several	7%
Omitted	38%

I. Sessions Attended in the 1975 Series

April 28 (Joseph Rezits) only	1%
May 5 (Ron Elliston) only	0%
May 12 (Eugene List) only	0%
April 28 and May 5 only	8%
May 5 and May 12 only	3%
April 28 and May 12 only	4%
All three	81%
Omitted	3%

J. How Participants Learned of this Series

UW Extension County Office	14%
Direct Mail	66%
Newspaper	5%
Radio	1%
Another person	8%
Omitted	5%

K. Persons who Attended the 1973 Piano Teachers Forum Via ETN

Attended in 1973	36%
Did not attend in 1973	60%
Omitted	4%

L. Persons Who Attended the 1974 Piano Teachers Forum Via ETN

Attended in 1974	27%
Did not attend in 1974	67%
Omitted	5%

M. Preference for Number of Programs in a Series

One	0%
Two	1%
Three	74%
Four	10%
Five	0%
Six	7%
Omitted	8%

N. Preference for Time of Year for a Series

Summer	5%
Fall	38%
Winter	10%
Spring	38%
Omitted	8%

O. Preference for Time of Day for a Series

Morning	92%
Afternoon	1%
Evening	1%
Omitted	5%

TABLE II (continued)

P. Preference for Day of Week for a Series

Sunday	0%
Monday	71%
Tuesday	14%
Wednesday	5%
Thursday	1%
Friday	0%
Saturday	1%
Omitted	7%

Q. Highest Desirable Registration Fee for a Series

$6.00	3%
$9.00	19%
$12.00	45%
$15.00	15%
$18.00	4%
$21.00	1%
Omitted	12%

R. Preference of Type of Program Design

1 session on elementary materials, 1 session on intermediate materials, 1 session on advanced	38%
2 sessions on elementary materials, 1 session on intermediate materials	18%
1 session on elementary materials, 2 sessions on intermediate materials	12%
1 session on intermediate materials, 2 sessions on advanced materials	16%
Omitted	8%

S. Preference of Type of Personnel Preferred in a Series

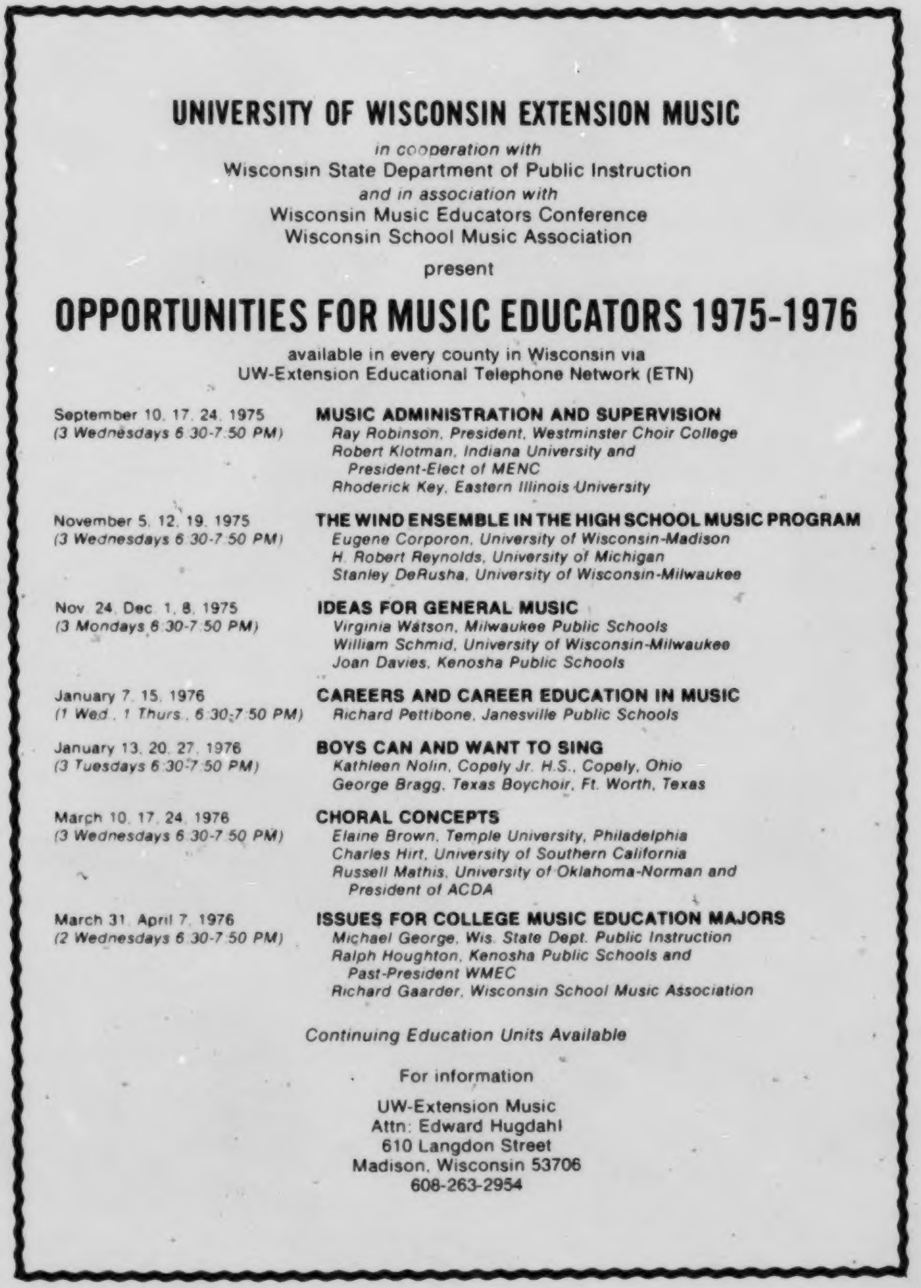
1 outstanding teacher of youth, 1 teaching piano pedagogy, 1 international concert artist	37%
2 outstanding teachers of youth, 1 teaching piano pedagogy	23%
1 outstanding teacher of youth, 2 teaching piano pedagogy	12%
1 teacher of piano pedagogy, 2 international concert artists	19%
Omitted	8%

T. Distribution of Participants in the State

Number of ETN Listening Stations Used	52	(52% of the 100 locations available for this use)
Number of Counties in which there were participants	48	(69% of the counties in the state)

TABLE III

ADVERTISEMENT IN THE WISCONSIN SCHOOL MUSICIAN, AUGUST 1975, USED TO PROMOTE THE FIRST YEAR-LONG SERIES FOR MUSIC EDUCATORS



UNIVERSITY OF WISCONSIN EXTENSION MUSIC

in cooperation with
Wisconsin State Department of Public Instruction
and in association with
Wisconsin Music Educators Conference
Wisconsin School Music Association
present

OPPORTUNITIES FOR MUSIC EDUCATORS 1975-1976

available in every county in Wisconsin via
UW-Extension Educational Telephone Network (ETN)

September 10, 17, 24, 1975 *(3 Wednesdays 6:30-7:50 PM)*	**MUSIC ADMINISTRATION AND SUPERVISION** *Ray Robinson, President, Westminster Choir College* *Robert Klotman, Indiana University and President-Elect of MENC* *Rhoderick Key, Eastern Illinois University*
November 5, 12, 19, 1975 *(3 Wednesdays 6:30-7:50 PM)*	**THE WIND ENSEMBLE IN THE HIGH SCHOOL MUSIC PROGRAM** *Eugene Corporon, University of Wisconsin-Madison* *H. Robert Reynolds, University of Michigan* *Stanley DeRusha, University of Wisconsin-Milwaukee*
Nov. 24, Dec. 1, 8, 1975 *(3 Mondays 6:30-7:50 PM)*	**IDEAS FOR GENERAL MUSIC** *Virginia Watson, Milwaukee Public Schools* *William Schmid, University of Wisconsin-Milwaukee* *Joan Davies, Kenosha Public Schools*
January 7, 15, 1976 *(1 Wed., 1 Thurs., 6:30-7:50 PM)*	**CAREERS AND CAREER EDUCATION IN MUSIC** *Richard Pettibone, Janesville Public Schools*
January 13, 20, 27, 1976 *(3 Tuesdays 6:30-7:50 PM)*	**BOYS CAN AND WANT TO SING** *Kathleen Nolin, Copely Jr. H.S., Copely, Ohio* *George Bragg, Texas Boychoir, Ft. Worth, Texas*
March 10, 17, 24, 1976 *(3 Wednesdays 6:30-7:50 PM)*	**CHORAL CONCEPTS** *Elaine Brown, Temple University, Philadelphia* *Charles Hirt, University of Southern California* *Russell Mathis, University of Oklahoma-Norman and President of ACDA*
March 31, April 7, 1976 *(2 Wednesdays 6:30-7:50 PM)*	**ISSUES FOR COLLEGE MUSIC EDUCATION MAJORS** *Michael George, Wis. State Dept. Public Instruction* *Ralph Houghton, Kenosha Public Schools and Past-President WMEC* *Richard Gaarder, Wisconsin School Music Association*

Continuing Education Units Available

For information

UW-Extension Music
Attn: Edward Hugdahl
610 Langdon Street
Madison, Wisconsin 53706
608-263-2954

HELPING CLERGY USE CONFLICT CREATIVELY

by

James A. Sparks
Specialist (Clergy Continuing Education)

The nation's clergy are vulnerable to stress in both their personal lives and careers according to several major studies. In a 1970 survey of 100 clients, the Midwest Career Development Center, Columbus, Ohio identified five major contributors of moderate to severe stress among clergy. They are:

1. *Role confusion.* In the midst of our changing society two questions clergy ask most frequently are: "Who am I?" "What should I be doing?" Many have discovered they were prepared for an occupation in which roles and expectations continually change. Divergent expectations between laity and clergy often result in severe stress and a sense of isolation.
2. *A feeling of isolation.* Since most churches have one minister, clergy feel they alone bear the problems of the church. They hesitate to approach their denominational hierarchy with pain or problems for fear it might be viewed as weakness or incompetence. One-half of the ministers said they had no one with whom they could talk freely.
3. *Financial compensation.* Although improving, clergy salaries are still behind other professions with comparable education.
4. *A lack of goal-directedness.* Over one-half the clients seen by MCDC indicated a lack of personal or career plans for their lives. Some felt it was inappropriate for ministers to make such specific career plans.
5. *The role of the spouse in career satisfaction.* Unlike most professionals, the clergy spouse plays a dominant part in work satisfaction. Clergy frequently express how they confide in their spouses. Praise from the spouse is highly coveted because they feel they are isolated from direct and supportive feedback about their work.

The findings of the career center were substantially reinforced one year later in a study of 5,000 clergy randomly selected from 20 Protestant denominations. More than two-thirds reported severe work-related stress in their lives. The research also reported that the two major obstacles to continuing education participation by clergy were lack of time and money. How could the University of Wisconsin-Extension address these immediate needs of clergy without undue strain on their time and monetary resources? As a full-time specialist in clergy continuing education with University of Wisconsin-Extension, I invited the chaplain education coordinators from the state's two mental health institutes to work with me on the project. We chose to use the University's Educational Telephone Network to reach the nearly 5,000 parish clergy of the state. What we learned from this experience could be applied to one, two, or five groups in a conference-call hookup through the local telephone company.

In the course of planning, four teaching-learning objectives were identified:

1. Help clergy accept conflict as a normal part of life.
2. Identify pastoral leadership styles that encourage or ameloriate conflict within an organization.
3. Identify techniques and processes that a pastor can initiate to cope with conflict within the church.
4. Identify ways in which clergy might deal with personal inner-stress.

THE DELIVERY SYSTEM

The principal method of instruction was small groups established in 20 locations with on-site leaders. The telephone system made it possible to hear nationally-known resource leaders. ETN is a two-way instructional communication system that transmits lectures and panel discussions via private telephone lines to 200 locations throughout Wisconsin. Through a specifically developed speaker system, students talk with each other or the speaker.

Two distinct elements in this program differentiated it from most ETN events. The first was the method of instruction. In most, if not all telephone courses, the ETN instructor who is at the point of origination is principally in charge. In this program, *local faculty had primary teaching responsibility* with their groups. The telephone presentations would be just one of the teaching aids at their disposal, along with discussion, case study, and role playing.

The other difference between this program and the usual method of using telephone teaching was in how the small groups functioned. Participants did not come just to receive information. The groups would develop their own life and define their own tasks within the program outline. Local leaders and their groups had freedom to work according to needs and interests of the participants.

To meet the objectives of both learning and method, the following elements went into this program:

1. Groups would meet five consecutive Wednesday mornings to discuss "Parish/Personal conflict: Disaster or Opportunity?".

2. Each session was structured into three, one-hour modules with the telephone presentation during the second hour.

3. As on-site faculty, we invited pastors, clergy educators, or chaplains identified as having group skills and solid counseling background.

4. Groups were free to use the other two modules as they determined. Participants were invited to bring in a written case study of a conflict situation in which they were currently or recently involved. This personal data then became agenda for group consideration. The ETN presentations would relate to these case studies.

5. ETN resources were nationally-known authorities in conflict management broadcasting by telephone from their offices. The ETN hour provided for two, 20-minute presentations followed by questions from the groups.

6. Faculty received orientation in two ETN meetings on teaching strategies, content outline, and syllabus materials. Guest resources came in by telephone at the second meeting to discuss their presentation follow-up by the groups. (This feature had some unanticipated payoffs that will be discussed later.)

7. A syllabus of teaching aids, papers, and methods for conflict resolution were compiled from materials provided by ETN leaders.

8. An extensive computer-tabulated evaluation was held at the end of the program.

9. ETN portions of each session were packaged on cassette tapes along with syllabus material for independent study or instructional use by the participants with their church boards and committees.

10. A one-hour brown bag lunch meeting was held over the ETN system to debrief faculty.

MARKETING AND PROMOTION METHODS

In this experience we learned as much about how to market as how to design a telephone teaching program. One brochure mailing was not enough. We asked the on-site leaders to do whatever they could to stimulate registration.

Most faculty said they would personally recruit students. They attributed their personal motivation to invest time in recruiting to the two faculty orientation meetings held in advance.

Later we learned that 13 of the leaders met with more than 25 clergy associations to promote the program. In addition, leaders made telephone calls and wrote personal letters to promote attendance.

CONCLUSIONS AND IMPLICATIONS

On the basis of this experience and evaluations of participants we conclude:

1. Highly subjective personal and interpersonal content can be managed in statewide educational settings using small groups, competent faculty, and telephone teaching.

2. Personal recruitment by highly motivated local faculty is a significant factor in attracting clients to programs.

3. This program methodology undoubtedly has implications for teachers, mental health workers, social workers, and possibly other community groups, especially in rural and isolated communities.

4. Seven of the groups continued to meet one month after the program, indicating this methodology has significant follow-up potential. Many clergy want to break loose from their isolation by becoming involved in colleague-support groups.

The telephone is a significant device for teaching/learning. It can reach vast and varied audiences.

Educators can expand the potential of the educational telephone technology by using it in combination with other methods and techniques. However, much care must be given to establishing the local group environment since this will be the primary center of the teaching/learning process.

Reprinted from Adult Leadership Vol. 24, No. 6, Feb. 1976.

A CASE STUDY OF ORGANIZING FOR A TELELECTURE COURSE OR WHAT TO DO BEFORE THE PHONE RINGS

April V. Beavers, Director
Project for Parents Understanding Student Handicaps-Outreach
Keyser, West Virginia

The program reported on herein was funded by U. S. Office of Education - Bureau of Education for the Handicapped to increase educational services for special pre-school children. The Mineral County Board of Education serves as the grantee for the federally funded training program and financially supports the PUSH Model of Services to Children in three demonstration classrooms.

Introduction

Planning is an attempt to control the future. It is an effort to reduce the incident of failure. Without planning we have only random behavior with random outcomes. In the movie, "Bonnie & Clyde," remember the incident when Clyde really wanted to make an impression on Bonnie? So, he decided to rob a bank. One small detail was omitted -- pre-planning! The bank was empty! Yes, embarrassment can result from a lack of pre-planning.

The success of an educational program delivered by telelecture can be directly related to the comprehensiveness of pre-planning activities and organization of resources before actual implementation of the program. This case study will present the pre-planning activities and organizing procedures utilized in the implementation of a state-wide telelecture network in West Virginia.

Planning Techniques

Techniques utilized in planning can be your insurance for success. Tools for systematizing the implementation of a total telelecture program include: (1) operation research, (2) systems analysis, and (3) contingency strategies. The telephone has been utilized in education for several years; therefore, *operations research* for telelecture planning can include a review of professional literature and expert's opinions. By contrast, research is limited in a new delivery method such as satellite broadcasting which has a minimal amount of literature and only a few experts. (4) Operations research will allow you to find out as much as possible about the system. What are the salient features of the more successful telelectures? What are the fatal features of the worst telelectures?

By *systems analysis*, identify all events which must be controlled. Pay particular attention to those elements which, unless controlled, can trigger problems. Below is a listing of those events which had to be controlled by the PUSH-Outreach (Parents Understanding Student Handicaps) program.

Elements to be Controlled

I. Personnel:
  A. Determine staff needed to coordinate effort
    1. Number
    2. Qualifications - determine
    3. Develop job description
    4. Establish presentor standards. (See elsewhere for potential problem spots)
  B. Participants:
    1. Determine target audience
    2. Criteria for eligibility

II. Logistics:
  A. Contact phone company
  B. Sites
    1. Determine how many and where
    2. Secure written permission for use of facilities
    3. Schedule individual telelectures
    4. Determine equipment needed
  C. Schedule on-site preliminary workshops

III. Content:
  A. Develop objectives for individual telelecture
  B. Develop problem solving situation for each session
  C. Develop and print script for each session
  D. Identify media required for each telelecture
  E. Develop supportive print materials

IV. Evaluation:
  A. Research appropriate techniques
  B. Develop method for feedback on delivery system
  C. Establish criteria for student performance
  D. Develop student testing procedures
  E. Identify media quality control system

The elements which proved to yield problems for the PUSH telelecture were as follows: (a) Communication with the Site Coordinators, (b) logistics in media management, (production or mail delays, arrival conditions, etc.), and (c) lack of available equipment at site. In addition, the presentor needs to be alert to *potential problem spots* in the telelecture delivery. Efforts should be made to include the following:

a. proper pacing
b. injection of humor (talk with a smile)
c. comfortable physical position of speaker
d. moderate pitch and volume
e. clarity and definition
f. transmission of personality
g. openness of attitude
h. articulation of units
i. balance of timing related to content and media integration

Gaming simulations (although not utilized by the PUSH staff) can assist in preparing for the unexpected. Think through and role play various situations. What would we do if...? This technique can assist in the development of *contingency strategies.* What will you do if the instructor has laryngitis? ...if, the visuals don't arrive at a few sites on time? ...if, one or two sites don't report in on time? By preparing written scripts ahead of time, alternate staff members can be prepared to substitute if necessary. Students can check minor points which may have been lost in transmission if scripts are mailed to each coordinator. Audio tapes of each session allow repetition of particular sessions for individual sites or students. Even when you think that you have planned for everything, ---be ready for the unexpected. For example, one of our sites was off the air on a particular evening because the transmission line had been shot down! Absolutely nothing could have prevented that situation. There is no way we will ever be prepared for all that life or a telelecture may bring.

The telelecture system exhibits many unique strengths, but there are also some weaknesses. To take advantage of the two-way communication and being able to reach out to individuals who are miles away, the instructor must be prepared to adapt the content. While the telephone may be somewhat impersonal, the instructor can initiate sessions from different sites. Thus she can increase awareness of the sociological and cultural differences among the participants.

Instrumentation

Tools can assist in program planning and development. Included here are the instruments which were developed for the PUSH telelecture planning. In developing visual supports for a telelecture, it is helpful to determine the most appropriate media for the function to be performed. (See Table 1) If the media materials are to be developed in house, a chart with pre-determined steps of production with corresponding time lines can be of assistance to coordinating efforts. (See Table 2) Quality control of such materials requires a systematic means viewing each item. Table 3 presents several factors and a format which were of value to the PUSH staff. Of equal importance is the instructor's pacing of content material. Pacing or the speed of delivery can directly influence the information received by the listener. Table 4 provides suggestions as to the speed of delivery for specific content material. Permission is granted for adoption or adaption of instruments presented in this article.

The inclusion of a problem solving session related to the content serves several purposes which will not be elaborated on here. The reader is referred to Puzzuoli (1) for further information. Table 5 summarizes consideration factors which can be reviewed in order to tailor the problem into a relevant and meaningful application/learning event. Section C of Table 5 is based on work by Benjamin Bloom (2) and Norris Sanders (3).

Interagency Cooperation

A multiplier effect on available resources can be gained through interagency cooperation. Programs with limited funds and enormous goals need to coordinate efforts with other agencies. Support for your programs can be gained by involving representatives of appropriate agencies in program planning and implementation. Thus, success will be enhanced for all involved. Cooperation may also identify community and professional needs for further program development.

The following are some of the means found to be successful in securing cooperation. First, one must identify those agencies which have a related mission and objectives. Next, identify the decision-maker within each of thos agencies. Individual or group meetings held with decision-makers from the related agencies can prove productive when all focus on possible collaborative efforts which meet commonly identified needs. It is important that each agency involved have a responsible role and function to perform in the coordinated effort and be able to meet their own objectives at the same time. Table 6 identifies agencies involved in the PUSH-Outreach effort and the services provided by each.

Summary and Conclusion

In program planning, one needs to consider the delivery approach and implementation techniques which are effective via telelecture. In preparation for implementation of the program, various steps should be taken. Objectives must be clearly defined and developed for each topic to be presented. Related problem solving situations should be structured. Attention should also be given to planning the coordinating software. The integration of a written script, media supports and personnel is a key element which needs careful consideration.

In conclusion, time is precious. Systematic planning can insure wise use of the instructor-student contacts. The program evaluation and review technique (PERT) should identify all events which will occur, set time lines for each event, and identify the manpower and resources needed to effectively fulfill the goals of the telelecture program.

TABLE 1

-- Summary of Functions of Media --

Function	35 mm Slides	Printed Material	Transparencies	16mm Films	Audio Tape	Film Strip	Video Tape
Detailed Spelling	X	X	X				
Inter-Relationships	X	X	X	X			
Reinforce Learning	X	X	X	X	X	X	
Display of Equipment	X	X				X	
Demonstration of Activity				X			X
Define Terms	X	X	X				
Identification of Lecture Topics	X	X	X				
Motivate Student Learning	X		X	X			X
Give Directions	X	X	X			X	

TABLE 2

Planning for use of Media	X	Comments	(Individual Responsible)	Date of Completion
1. Define objectives of unit				
2. Write script				
3. Identify most appropriate media				
4. Determine cost, availability and production time				
5. Develop media				

TABLE 3

Quality Control Factors of PUSH Produced Media	X	Comments
1. AESTHETICS: eye appeal, use of color, use of background, shading, lighting, blending of script/visual		
2. COMPOSITION: proportion, definition of detail		
3. CONTENT: tells a story, interest, succinctness		
4. SEQUENCING: continuity of information		
5. TECHNIQUES: f-stop, angles, distortion, depth of field, type of lense		
6. PRINT: size of type, positioning, amount of detail		

TABLE 4
Content Components Related to Speed of Delivery

Content Components	SPEED OF DELIVERY Slow	Medium	Medium/Fast	Fast
Definition	X			
Summary			X	
Objectives	X			
Spelling	X			
Example		X		
Greetings				X
New Concept	X			

TABLE 5
Critique for Related Problem Solving Situations

A. FACTORS IN STAGING PROBLEM:	Yes	No	Comments
1. Are relevant pieces of information present?			
2. Are extraneous factors needed?			
3. Is it a plausible situation?			
4. Is it relevant to objective of unit?			
5. Is problem related to pre-school child?			
6. Are all actors present?			
7. Are problem elements in order?			
8. Is one or more solution possible from information provided?			
9. What is the most appropriate media for presenting problem?			
10. Is the problem comprehensive and universal?			
11. Is the reading level appropriate?			

B. QUESTIONS RELATED TO SITUATION:	Yes	No	Comments
1. Are directions clearly stated?			
2. Are directions functional?			
3. Does the question make sense?			
4. What level of taxonomy is wanted for the question?			
5. Is the question worded at the selected level?			
6. Is a list of "good" and "bad" alternatives needed?			
7. Is the question related to situation?			
8. Is the grammar, composition, syntax, semantics and spelling correct?			
9. Can response be generated within time limit?			
10. Is the question specific enough?			

C. TAXONOMY OF QUESTIONS:	Yes	No	Comments
1. Memory: recall and recognition information			
2. Translation: changes information into different language			
3. Interpretation: student discovers relationships			
4. Application: solves vicarious problem, ID selection, use of appropriate generalizations and skills			
5. Analysis: solves problem with conscious knowledge of parts and terms of thinking			
6. Synthesis: solves problem with original creative thinking			
7. Evaluation: judgement of alternatives. Are a number of good alternative solutions possible?			

TABLE 6

SERVICES: / Agencies	Site Coordinators	Recruitment	Equipment Loan	Staff In Service	Financial Support	Technical Assistance	Education Materials	Registration Course Credit	Research Information	Facilities
1. Head Start	X	X	X							
2. Interagency Council of Child Development	X	X	X							
3. Children's Mental Health Services	X	X	X	X						
4. State Department of Education	X	X			X	X	X			
5. West Virginia University					X No Tuition	X		X	X	X
6. Hospitals			X							X
7. Local Boards of Education	X	X	X		X					X

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A STUDY OF USERS' REACTIONS TO TWO TELEPHONE TEACHING SYSTEMS AT THE OPEN UNIVERSITY

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Introduction

The use of the telephone for teaching purposes at the Open University represents an important attempt to bring together and put into practice two of the most influential ideas in education: that higher education should be easily available to all who are able to benefit from it, and that the process of education should be a two-way personal interaction between "teacher" and "taught". These two ideals may not at first seem incompatible, until one considers the fact that the constraints which until now had denied many people access to higher education - constraints such as geographical remoteness, physical handicap, or social responsibilities (e.g. bringing up children) - are the same constraints which are still preventing some Open University students from taking part in the tutorials and counselling sessions which compose the most important interactive and personal part of their course.

To these students, the Open University course may simply become another variation of the traditional "correspondence course" - a combination of written material to study, reading lists, written tests and assessments - plus the added Open University bonus of radio and television broadcasts; all non-interactive in any personal sense. These students may rarely have the time or opportunity to attend the monthly or twice-monthly face-to-face sessions at which they could meet fellow-students and their tutor or counsellor to discuss course work and problems of individual or mutual interest. Those people to whom the opportunity of higher education has at last been extended find that something else has been sacrificed - education has again become an impersonal one-way process.

It is possible that they therefore "lose out" in many respects: they may feel isolated and not really members of a university; they may feel the University has little interest in them personally or their success or failure in their studies; they may lack the opportunity to get to know fellow-students and to benefit from their mutual reinforcement and co-operative discussion of problems; they may fail to perceive what has been called the "hidden curriculum" - a cluster of barely-definable attitudes and behaviours which the University expects its students to develop and which can be 'picked up' by students from teaching staff and from fellow-students. All these factors may contribute to the final "losing out" - the student does badly in his studies, or loses interest and perhaps gives up altogether.

All this may be overstating the case. These feelings and attitudes have all been expressed at one time or another by individual students, but (as far as the authors are aware) no attempt has been made to show statistically that such attitudes are particularly strong amongst those students who are rarely able to attend tutorials, nor that such lack of attendance is correlated with academic failure or drop-out. Common-sense, however, would suggest a connection between these factors, and it is true that problems associated with students' isolation are recognized by researchers within the Open University to be of great importance and various methods have been sought to overcome them. One such method has been the introduction of "telephone tutorials" for students unable to attend ordinary tutorials at a study centre.

Two types of tutorial, using two quite different sets of equipment, have been organized; these are explained in detail below. One, the conference call, enables students to attend a tutorial without leaving home. The other, the Loud-Speaking Telephone (LST 4) tutorial, fulfills a slightly different purpose from that which we have been discussing so far - it enables the tutor to stay at home. Following the introduction of the teaching-by-telephone project, which was, and still is, somewhat of a pioneering move, it was thought advisable to make some attempt at evaluating the success of the project before expanding it to include large numbers of students.

The number of students taking part in the project in September 1974, when the evaluation began, was 88. Accordingly it was not thought feasible to attempt any strictly quantitative evaluation, such as statistical analysis of grades achieved in "Computer Marked Assessments" or of attitude scales for instance; because of the small numbers of students involved, the results would be inconclusive. It was therefore decided to attempt a qualitative "in-depth" study of the students' and tutors' reactions to using the equipment, and thereby make some preliminary judgement about the contribution made by the telephone tutorials to the work of the students and perhaps compare the costs and benefits of this system with those of the ordinary tutorial. Accordingly, such a pilot study was carried out in 1974/75 by members of the Communications Studies Group, University College London, in conjunction with Ben Turok of the Open University Regional Tutorial Services, and financed by the British Post Office. The remainder of this paper will describe the background to that study, the methods used and results obtained from it.

Background to the Project

In early 1973, the Regional Tutorial Services within the Open University set up a working party in London to look into the possibility of teaching by telephone. This meant the extension of tele-communication facilities provided by the Post Office to the teaching groups of the University. Pilot schemes were initiated and the North London Telecommunications

Project has been established to organize and plan the experiments. From the beginning, the project has developed rapidly to include a larger sample of staff and students, the number having almost trebled by September 1974.

In spite of this rapid development and the extension of the telephone tutorial to other parts of Britain, it should be emphasized that the North London Telecommunications Project has been in existence for less than 3 years and is still in its experimental stages. The present study of users' reactions to the telecommunication systems concentrates on this experimental stage, and the findings should therefore be treated as indicative rather than conclusive.

The two systems used by the Open University to facilitate group telecommunicated meetings are the conference call, and the loud speaking telephone (LST 4). The conference call is an operator-controlled system which enables up to eight subscribers (in some areas up to sixteen) using ordinary telephones at different locations to be linked together simultaneously. Conference calls must be booked in advance (about 24 hours) and because of limited capacity on the exchange, are only available at certain times. The system has been used in a variety of ways. Its main function has been to connect 'disadvantaged' students, who cannot attend study centres, with a tutor and with each other. Regular telephone tutorials have been carried out throughout the year, each student participating from his/her own home.

At the time of the study, the loud-speaking telephone was installed in four North London study centres. It functions like an ordinary telephone with the addition of amplification and voice switching. The LST 4 (the model used in this project) is portable and can be placed on a desk or table top. Incoming speech is amplified so that a group sitting round the telephone can all hear what is being said. There is also a microphone built into the equipment which is used instead of the conventional handset for transmitting speech. For additional efficiency, extension microphones and extension speakers have been used. Because no operator is involved, calls may be dialled directly on the equipment, using normal telephone lines. The LST 4 has been used to connect tutors with groups of students at study centres. The tutor can be located at any distance provided the trunk lines function reasonably well. From his home or office he can then lead a discussion or give a lecture to students who hear him and respond through the LST 4. Further experiments have been carried out linking LST 4s at two study centres, and also using the conference call facility in conjunction with two loudspeaking telephones to link a tutor to two study centre groups.

Methods Used in the Pilot Study

The survey consisted of a selected number of in-depth interviews carried out at subjects' homes or places of work, and in a few cases (where personal face-to-face interviews were not possible) by extended telephone interviews. Each face-to-face interview was tape recorded and lasted from half an hour to one hour. Basic questionnaires were used by the interviewers as a guide for discussion, but the interviews were intended to be as open-ended as possible, so that 'free comments' and impressions of the systems could be expressed. Factual questions were asked about the organization of the tutorials, preparation for them, number of students present, whether they had all met before, the pattern of interaction, the subject matter, technical difficulties, etc. Attitudinal questions were asked about feelings towards the subject matter, towards technology in general and telephones in particular, towards travelling and attending ordinary tutorials, also their feelings about their course in general and whether they felt they needed more personal instruction or other type of help; and lastly, in some detail, their opinions of the telephone tutorials.

Each subject was given a short check list to complete at the end of the interview comparing (where applicable) the face-to-face tutorial with one held over the telephone link. Responses to this check list will also be discussed below.

15 students and 4 tutors who had used the conference call, and 6 students and 4 tutors who had used the LST 4, were interviewed. Almost all those interviewed about the conference call had used the call at least three times, and most of the 'LST 4' sample had used the system at least twice.

All subjects in the student sample had been with the Open University for at least a year. Except for one, they had also all attended at least one face-to-face tutorial, so that they had a yardstick with which to compare the telephone tutorial.

Students using the conference call facility had varied reasons for taking part. They included psychological problems, (which made leaving home or meeting new people at the study centre difficult), evening or shift work clashing with the normal tutorial time, physical handicap, and need for extra academic support in addition to ordinary tutorials. Two additional students had asked to participate in the experiment out of interest rather than necessity.

Although these were the major stated reasons for non-attendance at study centres, problems of this nature are obviously more complex and there is often no simple or easily diagnosed reason for non-attendance. Travel to the appropriate study centre was often quoted as a major obstacle to the continuation of courses, and a problematic tutor/student relationship was also mentioned on several occasions as a deterrent to regular attendance.

In order to obtain a realistic impression of the conference call in which the interviewees were involved, one of the authors was linked up as an observer to one or more calls in each of the courses in the sample.

Findings: 1. The Conference Call

Organization

In the introduction of the service by the project leaders, there appeared to be quite strong reticence by the students to try out the telephone for teaching purposes. Many students who were approached initially by letter were subsequently contacted on the telephone to encourage them to try out the call. Having heard about the facility and indicating willingness to participate, most students were connected into the calls rapidly. All calls were held in the evenings, avoiding where possible the working hours of the students. The calls generally lasted for one hour.

The organization of the calls varied. Whereas some were structured and followed a pattern of lecture and discussion each session, others were more informal. This was entirely dependent upon the leadership or teaching style of the tutor. As the courses progressed, initial communication problems were ironed out and regular organizational patterns developed. The only change noted by several users was a growth of informality and ease with the system as familiarity within the groups developed.

Only a limited preparation for the calls was required as the system worked like most ordinary tutorials, on a revisionary/remedial basis. Thus the material to be discussed in the telephone tutorials had already been covered. Tutors gave some indication at the end of calls the topic of the next so that students could have the relevant course material and books at hand.

Several interesting situations arise when a group of dispersed talkers are denied visual contact with each other. Without visual cues, it is very much more difficult to immediately identify the speaker, and conversation is less easy to regulate. Glances, eye-contact, fiddling with papers, and taking notes - the attention seeking gestures, are absent in audio conferences, and some sort of compensation may be required if the communication process is to proceed unimpeded. Identification at the start of each conference call was achieved by tutors asking students to identify themselves before contributing to the conversation. After one or two meetings, identification by voice was acceptable to the majority and ceased to be a problem. In two of the three groups almost all conversation was channelled through the tutor during the call which aided the identification process. Thus most interjections were directed to the tutor, and any comments or discussion of the material was instigated by the tutor, who invited named individuals to respond. Conversation between students was limited, and it was rare for two students to speak consecutively without some prompting from the tutor.

For some students direct questioning from the tutor was helpful. "I am not one to speak up, but the tutor pulled me in." Several students mentioned this more egalitarian approach to discussion in telephone tutorials. "The conference call had very much the same format as the face-to-face tutorial except that the tutor had to name people instead of looking up for signals. You have to be more prepared when the tutor can't see your face." The general feeling expressed was of a welcome addition of discipline, imposed by the tutor to cope with the system, but helpfully regulating discussion. Because the conversation was structured, more individual participation was encouraged. Contrary perhaps to expectation, there seemed less danger of an individual 'hogging' the conversation than there was face-to-face. "I think on the whole I've probably learnt more from the telephone tutorial than I have from any others because you have a lot of people present at the study centre, (about 20-30), and the tutor stands up and says 'Well, what are we going to talk about tonight?' Unless you're quick and you want *your* particular subject, you are more or less saddled with having to listen to someone else's problem, not your own." This fear of being bored by other people's problems was avoided in the telephone tutorials. Because of the time limit imposed by the booking arrangements with the Post Office, students felt more reluctant to take a long time over personal problems and seemed to be conscious of the silent group even though they couldn't see them. If a particular problem, not common to the group as a whole, was discussed for any length of time, the tutor often suggested a private phone call later so that the matter could be dealt with on a one-to-one basis.

There was no mention by any of the students of awkward silences during the telephone tutorials. In fact, most of the subjects could not remember any unnatural silences occurring at all, and those who did experience any were always confident that the silence would be broken by the tutor. When a silence occurred, it usually followed an open question by the tutor such as 'Has anyone any problems about that?' Then, if no-one responded, the naming procedure would be used by the tutor to stimulate discussion. To avoid the post-question silence, a non-verbal substitute for visual gestures was the paralingual response of a grunt, groan or assenting noise. This was particularly true when the tutor was seeking assurance that the students were following what he had to say. To the question 'Is that alright?' the 'reply' invariably consisted of a series of grunts and hums!

Relationship with the tutor

Some students had met their tutors before the conference call, and felt that this made a difference. "It would have been impersonal if I had never seen the tutor, but I had been to two or three of her tutorials, so I had a picture of her there at the other end. I'm pretty sure that if I had no image of her and had never seen her, it would have been different." For those who had never met their tutors, there was usually some personal contact made by telephone between conference call sessions. Students were encouraged to telephone their tutors and counsellors if they had any difficulties with their course, although they were often reluctant to do so. One of the tutors made a point of instigating this private one-to-one telephone relationship, so that even if the students didn't contact her privately, she contacted them. This however was unusual, and communication did not flow in this direction in any other group.

Relationship with other students

Although the conference call did help to establish contact between the students, it was not seen as an adequate means of establishing social contact, only of continuing it once it was established. "It would help if people could meet once before they start so that they know what each other looks like and they know what they are like - what to expect. It changes your relationship with someone when you have met them face-to-face and spoken to them. I think it's because you're not talking to disembodied voices any more." The reassurance of some face-to-face contact for the groups would help, but with the dispersal of students, and their personal difficulties, this meeting (other than at day or summer school) is generally not feasible.

Relationship with the Open University

"All I need is something to connect me to the OU, and amplification of some areas of my work."

The feeling of belongingness and identification with the Open University in those who cannot attend study centres is obviously enhanced by a link to tutors and other students. "Without these calls, I would have been completely on my own", was one response. Direct contact with tutors was already possible for these isolated students, but the extra link to include the remote students in a tutorial group strengthened identification with the University. However, the calls were still seen as a substitute for the 'real thing' and as a complement to other student activities by those who could attend the study centre.

'I'm a great believer in the actual idea of linkups for those people who cannot get to study centres, but I myself would sooner have a face-to-face meeting with all the students sitting with me because I get a better feedback. You end up feeling good after one of these telephone linkups, but not as good as you do after a get-together with people. It's only a substitute, it's not as good as.'

Technical problems

Although the conference call was accepted as an adequate method of communication by most students, it should be remembered that this was the only means (for some at least) by which they could have tutorials at all. Because of this high motivation, a large degree of tolerance existed regarding the technical quality of the calls.

The quality of sound varied from week to week, and it was generally the case that a few lines were poor in each session. This meant that the sound level was unequal, and that while some students could hear perfectly clearly, others were having difficulty hearing at all. Despite this, only 3 students described the technical quality as "not satisfactory", and all were willing to put up with these problems in order to keep the calls going.

Surprisingly, few people mentioned the lack of a graphics facility as being inconvenient. The explanation was that, on the arts, educational and social science courses, use of graphics was already limited by the nature of the subject, and, since course material was used, it was guaranteed that every member of the group could have the relevant written material in front of them during the call. There were more problems with the science conference call, but work was restricted to the course material where possible, and on a couple of occasions, the tutor proposed duplication of individuals' work to be circulated to the group before a call. Teaching was adapted to the medium in all cases, and words were used to describe concepts which would otherwise be shown on the blackboard or overhead projector. Certain discipline, particularly for the science students, was required to explain concepts verbally, but in general adaptation was quick and troublefree.

Students' use of the telephone

Students were asked about their use of the telephone outside the Open University. It was important to discover what general attitudes existed towards the telephone, because negative attitudes might well influence attitudes to the conference call. Of the sample, eleven of the students were regular telephone users, feeling quite comfortable using it. Two were not happy about using the telephone at all, and it was a concession that they took up the conference call. Talking over the telephone, although posing no problems for a majority of the students had an effect on their level of participation in the tutorials. A couple of students felt threatened by the presence of the tutorial group at the study centre and were much more at ease and comfortable talking over the telephone. The anonymity of the medium suited the shy. "If you burn with embarrassment it's within your own living room. If you look silly, nobody knows you anyway." On the other hand there were those who felt that the telephone was restricting. "I hardly talked at all. If I'd seen the people I might have been able to talk more."

Advantages and disadvantages

Most of the advantages and disadvantages of the system have been expressed under different headings in this section. It would seem simpler here to list those recurring frequently.

Advantages:

1) Convenience. Time and travelling saved. Some journeys to the study centres were very awkward.

2) Concentration. More concentrated work achieved because of the focusing of attention and less distraction.

3) Control. More control on amount of talking by students.

4) Contribution. More chance for individuals to contribute in discussion. (Both 3 and 4 relate to the additional regulation of conversation in the conference call as compared with ordinary tutorials.)

5) Reference. Convenience of having all the relevant books and papers at hand during the call.

Disadvantages:

1) Impersonal. Little social contact possible over this medium.

2) Time limit. Regulated time meant a restriction of conversation.

3) Technical. Problems relating to sound quality, interference etc.

4) Discomfort. Using the handset for a prolonged period of time.

5) Graphics. Lack of graphics facility.

6) Social. Using a telephone line which may be required by others.

Other points for or against the system mentioned related to the organization of any Open University tutorial, and were not specifically applicable to the telephone tutorial.

Satisfaction with the system

Ten out of the sample of thirteen students would be happy and willing to use the system again. Few reservations were put on the continued use of the telephone for tutorials, the only significant one being a hope that the technical quality of the calls could be improved.

The level of satisfaction obtained from the calls depended on a more fundamental question; the nature of the tutorial itself irrespective of the medium used. Different tutors had different methods of conducting tutorials, although Open University policy is that the tutorial should be a 'remedial' discussion unit supporting the ongoing teaching programmes. Thus the level of satisfaction of students towards their tutorials was determined by expectations. Those who expected new material and stimulating lectures were often disappointed, as were those who knew their material already and who were experiencing little difficulty with the course. The reasons for attending tutorials were thus highlighted, and these should be considered when offering the facility of the telephone tutorial to students. For example, the student who dropped the conference call after only one session said:

"I've no particular difficulty studying on my own - the fact of not having a tutorial didn't bother me at all."

For those home-bound students who need the contact and stimulation of other students 'to keep their perspectives' the call would seem to be ideal. Similarly for those who are struggling with the course, and who either cannot attend tutorials face-to-face or who cannot be helped adequately through this method, the call would appear to be a help.

Tutors' comments

The organization of the calls was left very much to the individual tutor, although several general points were stressed. Each tutor was supplied with a set of notes written by various users of the system to give them hints on using the equipment. One point noted was that careful preparation was required for the call: more, in some cases, than would be expected for a normal tutorial. One estimate was an hour's preparation time for a forty-five minute call.

It was generally felt that the type of leadership required over the telephone was more directive than that needed in a face-to-face tutorial. "The tutor who sees his role as a passive one will not succeed in this type of tutorial" according to a regular user of the system. Comments from the tutors illustrated this adaptation of role:

"You are in much more of a teaching role - in terms of organizing people - than you are in a face-to-face tutorial, because the mechanics are such.... you are more a chairman because you have to regulate discussion." The chairman's role included the task of making sure that everyone who wanted to have a say in the discussion was brought in. There was great sensitivity shown towards this systematic contribution by students, with an attempt to encourage a situation in which members of the group could take part in the discussion equally and easily. The sense of egalitarian contribution desired by the tutors was transferred to the students by 'going round the table' so as to include each individual. One tutor felt the necessity for protecting the students from undue pressure to speak if they did not wish to and made it easy for the individual to decline from contributing if he or she felt unwilling to do so. Balance between encouragement and protection could only be achieved by getting to know the students individually between calls, and by becoming aware of individual problems.

The necessity of having a constant group, with at least three or four core members must be stressed. Great difficulty was experienced by one tutor in organizing a group which never had a chance to settle down. Organization seemed to break down completely resulting in a poor experience of the system because there could be no planning and no continuity. The tutor commented, "By the time I had got round to the third call it seemed to me that planning was quite pointless. All I was really running was a guidance and advice call for my two regular students plus anyone else who wanted to come along." Communication between headquarters and the tutor seemed to be vital: the influence of the former in setting up a group who are stable and who are really interested in taking part in the call is essential.

The problems encountered by this tutor were not isolated. In the first year of the project, one series of calls had broken down because the number of students varied; a nucleus of interest was never established and a pattern could never be worked out. Even in a more established group, the lack of numbers can make the going difficult....

"The atmosphere changed with the number of people on the call. When there were only two students on the line, the tutor called the tutorial off after half an hour because it seemed rather a strain."

Continuity obviously relates to preparation for the calls. All tutors tried to establish a programme for the following call so that students could be prepared and make a better contribution. In one case, the tutor made a point of telephoning each student individually between sessions to check that the work was progressing satisfactorily and that preparation for the next call was going ahead.

The main advantage of the system was seen by the tutors as that of providing students who could not otherwise attend study centres with some form of tutorial, "because it can only be bringing them something which they otherwise wouldn't get at all". Questions were raised, however, about the eligibility of the students for the calls. It was realized that some students who were on the calls were also regular attenders of the study centres. Also some who were on the telephone calls, classified as 'disadvantaged', seemed little motivated to attend study centres in the first place, and were thus not necessarily well-motivated for any type of tutorial. One tutor was told that there was a demand for the telephone tutorial from the students, but was sceptical, "It seems to me that either there was a need for the call which the university was observing or there was not. I didn't see the real point of creating a need of this kind in order to sustain the viability of my tutorials".

Together with the necessity of a stable group, it would seem essential to have students who are well motivated and who do require tutorial support of some kind.

Finally tutors were interested to maintain the face-to-face tutorial alongside the telephone tutorial, so that methods and material could be gauged with a group of students in front of them as well as over the telephone. One aspect missing from the tutor's point of view was lack of feedback. It is one thing to teach in front of a group of students, another to rely on noises and interruptions to know if you are being followed or understood.

Comparison with the face-to-face tutorial

All users of the conference call were asked to fill out a short check list comparing their experience of the face-to-face and telephone tutorials. Out of the nineteen subjects interviewed, seventeen were able to make adequate comparison between the two types of tutorial. The telephone tutorial was found to be less aggressive and less entertaining than one held face-to-face. For other factors, such as constructiveness, interactiveness and formality, responses were closer to the mid-point indicating less difference between the two types of tutorial. It should be remembered that these comparisons are based on a very small sample number (students 13, tutors 4) and that the responses are therefore only indicative.

Findings: 2. The Loudspeaking Telephone (LST 4)

The students and tutors interviewed came from two different groups at different study centres, and differed widely in their experiences with the LST 4 and their opinions about it.

In both locations the equipment had been used to link a tutor using the telephone in his own home with a group of students listening to his amplified voice in a study centre. In both locations, technical difficulties had been experienced with the equipment. It was generally the case that the tutor could be heard, but if a student wished to speak he had to be within 2 feet of the apparatus in order to be heard properly by the tutor. With up to 20 students in the room, this meant that a kind of "musical chairs" sometimes ensued in which students took turns to speak into the equipment. Even when an extension microphone was available, the formality involved in handing it round meant that "there were no discussions, just a one-to-one question and answer".

This limitation of the equipment was obviously an important factor in the different experiences of the two groups interviewed, because the group who expressed favourable attitudes to the system had organized the tutorial and used the equipment in such a way as to minimize the technical drawbacks. This group had organized the tutorial so that the tutor would begin by giving a talk lasting for perhaps half of the tutorial, and this would be followed by questions and answers and perhaps some discussion. In contrast, the group who were unfavourable towards the system had used it for an unstructured discussion period for which they had no specific subject-matter prepared nor any introductory talk to set the ball rolling. In one such tutorial, "the tutor just came on the line and said 'Well - what would you like to know?' and we all just looked at each other". This demonstrates quite clearly not only how not to organize a telephone tutorial, but also how not to organize *any* tutorial. But whereas, in the normal face-to-face situation, such disasters can be dragged back by the scruff of their necks into some semblance of constructiveness, this does not seem to be so with the "remote tutor" situation - or at least, it is considerably more difficult. This emphasizes again the point made in relation to conference calls; proper preparation for the tutorial is even more essential than in an ordinary tutorial. It also emphasizes the way in which certain types of organization of a tutorial (in this case open discussion from the start) can be quite unsuited to the medium being used and could lead to the build-up of completely negative attitudes towards further use of the equipment. Fortunately, the group of students who were unfavourable to the system realized that this was due to the particular way in which they had used it and were very much in favour of using it to listen to talks and ask questions in the same manner as the other group had done.

During these sessions, the "student counsellor" was present with the group of students and often had to act as a sort of chairman and as an intermediary between the tutor and the students, making comments to the tutor such as "people here are looking puzzled.... some people are nodding". When interviewed, one counsellor said "I felt like a chairman and commentator rather than a counsellor for those sessions. I think you have to put yourself in that position or you swamp the bloke at the other end". Students agreed on the importance of this role of the counsellor, the "unfavourable" group feeling very strongly that a large part of the reason for the failure of the tutorials could be attributed to the unwillingness or inability of the counsellor to play this role.

Both groups found that, even in a quite active discussion, most remarks were directed to the tutor rather than to other students in the room, and that discussion between students rarely took place. This again was dictated by the medium being used - probably only one student at a time could be heard by the tutor unless both students happened to be sitting very close to the microphone.

Because the experiences of those who used the LST 4 were so varied, it is difficult to list advantages and disadvantages of the system, since what is an advantage in one situation may not be so in another. However, one obvious limitation is the technical ability of the equipment, and one great advantage is the potential of the system to bring in experts in any field to talk to groups of students many miles away without the necessity of travel.

On the attitude scales, the "favourable" group judged LST 4 tutorials to be more interesting, constructive and enjoyable than face-to-face tutorials, while the unfavourable groups judged LST 4 tutorials to be worse than face-to-face on all these counts.

Conclusions

Although the two systems which have been discussed are very different both from a technical point of view and in the purpose to which they were put, very similar overall conclusions emerge from the study of their use.

Firstly it is evident that methods of teaching must be adapted to suit the medium being used, and that the medium itself becomes almost like a "third party" with whom the students and tutor have to interact.

Secondly, not only is the general structure of the tutorial changed but also the roles of the participants, and therefore they must be prepared to change their individual styles of interaction, not only at the level of saying "yes, we understand" instead of the usual nodding of the head, but also at the level of changing their roles completely, as in the case of the LST 4 counsellor.

Lastly, it is evident that telephone teaching is far more susceptible than face-to-face teaching to failure through factors other than the medium itself, the most important of these being the amount of previous preparation for the topic under discussion.

Since this pilot study was carried out, the success of the teaching by telephone project, especially the conference call, has increased and the numbers of those students who wish to take part in conference calls (originally intended for "disadvantaged" students who found it virtually impossible to reach study centres) has now expanded to include many students for whom travel to study centres would be merely inconvenient. Indeed in some cases it has become a supplement to such travel rather than a substitute.

Conference calls are by no means always regarded as "second best" to a face-to-face tutorial; several reasons were given for positively preferring them, even if discounting the obvious advantage of not having to travel. Conference calls have also been put to another use; students have organized self-help groups via regular calls and so have been able to supplement the mutual help given during tutorials.

The enthusiasm with which students have accepted conference calls is very encouraging and also very revealing; for some students the calls have obviously filled quite a big 'isolation gap' which might eventually have led them to give up their course. For others, especially those with a full-time job and a family to think of in addition to their education, it has merely made the whole exercise a lot less hectic.

It is hoped that in the near future funds will become available for a further study to be carried out by the Communications Studies Group in conjunction with the Open University, to examine more thoroughly the hypotheses and ideas which this pilot study has generated.

PITFALLS IN THE SOCIAL EVALUATION OF TELECONFERENCING MEDIA

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As new media for group communication are developed, the immediate question is one of choice: which medium should be used when, and with whom? The longer range question is one of social impact: how will new media affect the way people communicate? Social evaluation of teleconferencing media to date has only begun to provide useful answers to these questions. It has rarely been used by developers of new systems, and its focus has been scattered. But this somewhat inglorious history belies the importance of the work. With an increasing sensitivity to needless travel, with generally contracted budgets, and with a growing variety of available teleconferencing media, choices will be made and social impacts will be felt.

The current state of social evaluation efforts is characterized by a lack of integrating theoretical perspectives.[1] However, the growing number of evaluation efforts are at least serving the important function of highlighting potential pitfalls. These pitfalls suggest more sophisticated approaches soon to be developed.

Pitfall 1. The standards of face-to-face communication should not be the sole basis for evaluation of teleconferencing.

It is tempting to think of teleconferencing systems as surrogates for face-to-face meetings. Such a horseless carriage approach, however, invites misinterpretation of the strengths and weaknesses of teleconferencing media. One of the limitations of a face-to-face meeting, for instance, is that only one person can speak at a time. Should teleconferencing media also have this limitation, even if it is unnecessary? In computer-based teleconferencing,[2] for example, it is possible for everyone to contribute simultaneously; the computer orders the entries based on the time each entry is begun. While new media could certainly be designed to allow only one person to "talk" at a time, it is not clear that this face-to-face pattern is always optimal. If equal participation by all group members is a goal, a medium which allows everyone to "talk" at once might prove very desirable, since it would be difficult for any single person to dominate the discussion.

Another basic characteristic of face-to-face meetings is visibility: everyone sees each other. Should electronic media, too, try to provide visibility? Research to date suggests that an audio channel is quite adequate for many tasks and that the full video picture may not always add to the quality of the meeting. Preliminary comparisons by Casey-Stahmer and Havron indicate that the advantages of full video are incremental, while the increase in cost is very large.[3] Less expensive systems such as slow-scan video or facsimile reproduction often provide the necessary adjuncts to an audio system without the move to a full video system.

Recent experience with the Picturephone provides an almost classic illustration of this pitfall in social evaluation. The technologists who developed the Picturephone® simply assumed that if a picture could be added, people would like the telephone all the more (apparently, because it would be the *next* best thing to being there). Yet in the test marketing of the new technology, the response was far from enthusiastic. Obviously, there were characteristics of the Picturephone® which some people did not want added to their audio-only telephones. It may be that the "limits" of the telephone--its reliance on only voice--are actually desirable for some sorts of human communication. These resistances are explored to some degree in the Dickson and Bowers report *The Video Telephone*,[4] but important questions still remain. For Bell, the apparent failure of the Picturephone® has meant back to the labs. Thus, the assumption that people *need* all of the characteristics of face-to-face communication in order to perform group tasks is certainly open to question.

A beginning point in evaluating any teleconferencing medium is to map its essential and potential attributes.[5] Obviously, there are system design questions in such an exercise, since there will always be some range of possible attributes which could be made available. Initial social evaluations should occur, ideally, during system design phases. At this point, of course, the evaluator is often aiming at a moving target, as alternative designs are explored. Eventually, though, basic design decisions will be made, and more comprehensive evaluation, which does not simply judge the medium by the standards of its predecessors, will be possible.

Pitfall 2. It is always difficult and often impossible to distinguish among effects related to communications medium, group task, group dynamics, and personality factors.

In trying to make choices among teleconferencing media, it is important to differentiate between effects of the medium and those related to other characteristics of the communication situation. At the Institute for the Future, we became interested in this process of differentiation in 1972 and were surprised to find little agreement among researchers about the most basic variables to be considered in studying mediated group communication. An early taxonomy had considered dyadic communication,[6] and there are some definite resources in the literature of small group research.[7] But researchers evaluating teleconferencing did not (and still do not) have a common taxonomy of elements which are routinely considered. In early 1974, the Institute cosponsored a workshop with the Department of Communications, Canada, to develop such a classification of basic elements in a communication situation before the process of communication actually begins. Thirteen active researchers attended and ultimately agreed upon a general framework. Within this framework, the basic factors were grouped under the headings of "medium," "task," "group," and participants."[8]

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*The author of this article has been working for the past three years with a team of researchers headed by Dr. Jacques Vallee at the Institute for the Future. Others have included Dr. Hubert Lipinski, Kathleen Spangler, and Thaddeus Wilson. Primary support for this work has come from the National Science Foundation.

The important question, given a taxonomy, is: How does one understand the relationships among the basic elements? Edward Cavert has developed one approach for examining the most desirable medium characteristics for specific educational tasks.[9] Using Bloom's taxonomy of learning as a referent, he lists each available communications medium (in a university, for example). Then, he simply asks which medium (media) will be most effective for communicating each level of learning in Bloom's taxonomy. In so doing, Cavert provides a basic framework for educators to make judgments about how a given communications medium relates to a hierarchy of learning tasks.

While such an approach distinguishes the effects of the medium from those of tasks, it still does not reveal important relationships among group and personality factors. Traditionally, controlled experiments have been the social science methodology most suited to isolating such specific effects.

Pitfall 3. Laboratory methods have only limited application in the evaluation of teleconferencing media.

Because of the multidimensional confusion outlined in Pitfall 2, it would seem logical to use a highly controlled laboratory environment for initial tests of teleconferencing. There have already been a number of laboratory experiments for face-to-face communication situations, and some efforts at media comparison are now attempting to replicate their findings for various teleconferencing systems. Roxanne Hiltz, for example, has reviewed the literature of small group research to identify experiments relevant to computer-based teleconferencing.[10] Having identified these experiments, she now plans to replicate some of them and compare the findings. Such an approach is provocative and useful, but it will be necessary to interpret the results with great care. The literature of small group research is far from highly organized in its approach or findings, making direct replication difficult. Also, it will be difficult to control for variations in group and personality factors. Nevertheless, such experiments could provide useful clues which could then be tested more broadly in field settings. For instance, if one type of task is found to be particularly well-matched to a teleconferencing medium during a laboratory test, similar tasks in actual organizations could be identified. Then, field tests with the medium might be employed to see if comparable results could be obtained. Also, experiments might be used after field tests in order to provide more controlled tests of specific hypotheses.

It is interesting to note that the most experienced research group in social evaluation of teleconferencing--the Communications Studies Group in London--began its program with an almost exclusive concentration on laboratory experiments, some of which were designed to replicate early work with face-to-face groups. However, the CSG work has now shifted heavily toward field tests and away from the laboratory. This shift is significant, I think; it suggests that there are fundamental problems in the laboratory approach.

One problem with laboratory experiments is the artificiality of the communication situation, particularly in regard to assigned tasks. Participants are typically given a problem which they are to solve by communicating through one or more media. The impressive experiments by Alphonse Chapanis,[11] for instance, have used simple tasks such as assembling a garbage can carrier. One participant has the instructions; the other has the parts, and they are to jointly assemble the device. Such experiments have been very useful in expanding the range of dependent variables used in the evaluation of teleconferencing. However, their implications for use of teleconferencing in real-world situations are far from conclusive. First, results from two-person experiments are not always generalizable to groups of three or more.[12] Second, results from experiments with simple tasks are not always generalizable to "real-world" tasks. Finally, laboratory experiments usually involve only short periods of usage by subjects, and it is very possible that their behavior would change with extended usage. This last problem leads us to Pitfall 4.

Pitfall 4. Initial uses of teleconferencing systems often serve as a poor basis for generalizing about future uses.

Just as it is tempting for evaluators of teleconferencing to use their experience with face-to-face as a standard, so it is with new users of teleconferencing. Quite predictably, first-time teleconferencers will generalize from their past experience (usually dominated by face-to-face communication) and attempt to communicate in the same fashion via the new medium. Over a period of time--though it is difficult to say how long--this generalization effect will wear off and communication more authentically related to the medium will begin to appear. However, if initial sessions are used as a basis for evaluation of the teleconferencing system, the results could be quite misleading.

Experience with video conferencing provides a particularly dramatic example of this problem. The "Hollywood" associations of video communications have influenced both developers and new users. Rudy Bretz, in a Rand Corporation evaluation of the Metropolitan Regional Council (MRC) video teleconferencing system, offers the following observations:

> "Even the semantics of MRC supported the ["Hollywood"] model: broadcasting words such as television network, program, show, studio, director, producer, and performer were in constant use. Under strong Rand recommendation these words were slowly replaced with a new vocabulary that included meeting, coordinator, participant, and the like... At first, the meetings were introduced almost like television programs."[13]

With a medium as novel as video teleconferencing, and particularly with its associations with television, new users will take some time to adapt. Initially, their perceived expectations will shape their behavior. Over a period of time, though, they will learn the subtleties of self-presentation via the new medium, developing personal styles of usage. These personal styles may be the most important source of information about the strengths and weaknesses of a particular communications medium. And evaluators who look only at initial usage of a new medium are likely to miss this information altogether.

Studies of learning in teleconferencing systems are, in themselves, informative. Attitudes of new users may well vary from those of more experienced users. In an evaluation of the University of Quebec audio conferencing system, for instance, new users preferred face-to-face meetings to the teleconferencing system. On the other hand, experienced users felt the new medium was just as successful as face-to-face.[14] This finding contrasts with an earlier Bell Canada study which found new users more positive than experienced users toward conference television in comparison to face-to-face meetings.[15] Such findings point to experience with a teleconferencing medium as an important "participant" factor.

The temptation to evaluate teleconferencing systems by initial applications is worsened considerably by the call for "substitution" of telecommunications for travel. The argument for substitution is often based on the questionable assumption that a communications medium can be substituted for travel without altering the nature of the communications situation. With the recent energy crisis, this belief was given new life by Washington officials hoping to reduce travel. However, there is little evidence that direct substitution can occur--except in the most simple of communication tasks. Kollen and Garwood have now reported the results of their extensive Canadian survey; this survey indicates that perhaps 20 percent of business trips might have been substituted by communications media if they had been available. They note, however, that: "the phrase 'substitution' is used here as a shorthand expression that refers to very complex, mostly unknown (to date), relationships between the transportation and communications sectors of our society."[16] Furthermore, they found no consistent factors which distinguished the "substituter" (person who would substitute communication for travel) from the "nonsubstituter."

The potential for substitution of teleconferencing for travel remains largely obscured by intervening variables; that simple substitution of new communications media for travel will occur seems a shallow hope indeed, with little in the way of support. This unproven hope, however, remains to encourage casual applications of teleconferencing systems without consideration of the complexities of human communications processes. Such uses of teleconferencing are likely to prove ineffective, but their "failure" will be more closely linked to ways they are introduced rather than to the characteristics of the new media themselves.

Martin Elton has commented on his own work with the Communications Studies Group by saying: "The work has been based so far upon the meetings that now take place; as important in some instances will be those that do not take place (but, in some sense, should). It is worth considering how well someone fifteen years ago might have predicted present use of photocopies from statistics on the use of carbon paper."[17] This comment is an appropriate critique of virtually all social evaluation of teleconferencing to date. Evaluation is too often based on replicating existing communication situations via electronic media without considering the long-range potential of the media for introducing new communication opportunities. We need to ask whether new types of meetings will occur. As Stapley points out, we must also ask whether participants in teleconferences will be the same as those at the face-to-face meetings which they may be replacing.[18] Questions of this type are fundamental to social evaluation of teleconferencing, but they cannot be pursued with pedestrian approaches. If social evaluation is going to provide a basis for informed choice, it must be skeptical of initial applications of teleconferencing, particularly if these applications are prompted by short-sighted efforts at "substitution."

One approach to evaluation which seems particularly promising is the careful study of a small number of groups over an extended period of time, perhaps as they use different communications media. While such an approach is costly in both time and money, it counters Pitfalls 1, 2, and 4. Each group can be periodically queried for their assessments of each medium, and their actual usage pattern can be observed. With this time series approach, changing styles of communication and varied reactions can be studied over time. Also, each participant's evaluation of each medium can be taken more seriously since comparative experience will be high. It remains, however, for the evaluators to develop test instruments which will tap this experience by focusing on cross-media comparisons.[19]

Pitfall 5. While field test questionnaires can be improved by using questions applicable to several media, there is little hope for a "universal" questionnaire.

The notion of a standardized questionnaire to aid in the evaluation of teleconferencing media is appealing: users of different teleconferencing media could be given a common set of questions and their responses compared. In 1974, researchers at the Institute for the Future, Bell Labs, and Communications Studies Group began to design such a generalized questionnaire. CSG already had the beginnings of such an instrument in their questionnaire for the evaluation of the British video teleconferencing system called "Confravision."[20] Over a period of several months, we debated the content of the questionnaire via a computer-based teleconferencing link to Europe. The major problem was to construct an instrument which would gather enough information about each particular teleconferencing situation without becoming so long that nobody would take the time to fill it out. Also, there were numerous questions which were important to one medium, but irrelevant to others. After intense periods of frustration, the Bell Labs researcher dropped out of the effort with little hope for its success. A draft questionnaire was eventually completed; it was about 20 pages long. Our opinion is that, though the questionnaire offers a useful pool of potential questions, it is too long to be useable as a "universal" questionnaire for evaluating teleconferencing systems.[21]

One set of questions, however, is promising in terms of cross-media comparisons. This set of questions uses the DACOM (for Description and Classification of Meetings) scales derived from a major study of business meetings.[22] These scales provide a basic grouping of task types (see Table 1). Referring to them, respondents can indicate whether they feel that the medium they have used would be effective for each task type. This set of questions is, to my knowledge, the only set which is currently being asked across teleconferencing media. CSG is using them in their evaluation of audio and video systems; the Institute for the Future is using them in evaluation of computer-based teleconferencing. While the DACOM scales are quite broad, they are relevant to many situations, and their use by others should probably be encouraged, since they are as close as the field may come to a "universal" questionnaire.[23]

Pitfall 6. Behavioral data can and should be gathered during teleconference tests, but the results are sometimes deceptively quantitative.

Teleconferencing media are unusually powerful in terms of their ability to gather quantitative information about patterns of interaction among participants without violating the privacy of the proceedings. Table 2 displays the basic statistics gathered unobtrusively and automatically during our evaluations of computer-based teleconferencing. These statistics (accessible during face-to-face meetings only through

TABLE 1. BASIC DACOM SCALES NOW BEING USED IN EVALUATION OF TELECONFERENCING SYSTEMS (Developed by Communications Studies Group)

How satisfactory do you think (a given medium of communication) would be for each of the following activities?*

- GIVING OR RECEIVING INFORMATION
- PROBLEM SOLVING
- BARGAINING OR NEGOTIATION
- DECISION-MAKING
- GENERATING IDEAS
- PERSUASION (getting others on one's side in an argument)
- ASKING QUESTIONS
- RESOLVING DISAGREEMENTS
- GETTING TO KNOW SOMEONE (forming an impression of others)
- GIVING OR RECEIVING ORDERS (delegating or accepting instructions)
- MAINTAINING FRIENDLY RELATIONS (staying in touch; keeping people up to date)
- EXCHANGING OPINIONS (discussion of ideas)
- OTHERS (What? . . . .)

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*Respondents are given a 7-point scale from "very satisfactory" to "very unsatisfactory."

TABLE 2. BASIC USAGE STATISTICS GATHERED BY PLANET COMPUTER-BASED TELECONFERENCING SYSTEM (Developed by Institute for the Future)*

- Number of public messages
- Length of public messages (in words)
- Number of private messages
- Length of private messages
- Number of private messages received
- Typing speed
- Number of sessions (times logged-in)
- Use of editing commands
- Use of special features (e.g., machine search of transcript)
- Dates of participation
- Times of participation
- Time zone of participants
- Session durations
- Amount of time when more than one person is present in the conference simultaneously
- Cost

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*Each statistic is gathered for each participant and for the conference.

human coding) might also be available to evaluators of some audio and video conferencing systems through the use of microphone switches attached to counters. In this way, basic interaction patterns could be quantified.

For example, if teleconferencing were being used in teaching, the number of inquiries to the teacher could be recorded, as well as other factors such as the direct interaction among students. Such statistics provide basic information about the ways in which a group communicates. Group roles can be studied and the formation of subgroups examined. This sociogram-like analysis can provide an unusual insight into group process, yet it can be done painlessly. It can serve as a key input to the evaluation of the group process effects of alternative teleconferencing media and can also be used by group members in evaluating their own efforts. Unfortunately, I do not know of any present audio or video systems which incorporate an inherent data-collecting capability.

Usage statistics, of course, record only the quantity of participation and something about the direction of person-to-person exchange. And qualitative judgments about interpersonal relations, group dynamics, and leadership styles, however illusive, remain as important for telecommunication as for face-to-face communication. Their significance is often overlooked, though, probably because the technology of teleconferencing is typically so visible. Thus, usage statistics must be interpreted in the light of direct feedback from users and perhaps periodic content analyses of proceedings.

While emphasizing the desirability of gathering statistics on usage patterns for teleconferencing tests, it is also important to note that this power could easily be misused to violate privacy. Even though usage statistics can be gathered without reference to the substance of the conference, such patterns as the participation rates of each individual and the formation of subgroups can also be monitored and perhaps punished or rewarded. I am told that telephone operators are already monitored in a similar fashion, at least in some locations, in an effort to reduce the amount of time spent with each customer. Such electronic monitoring has a definite potential for misuse. It is my opinion that the gathering of usage statistics should always be made clear to participants before they use a teleconferencing system. Also, participants should have the option of turning off the statistics-gathering apparatus, especially when such systems are in real-world usage.

Conclusion

The pitfalls outlined above are imposing; they suggest that valid social evaluations of new teleconferencing media are very difficult to achieve. However, several overall conclusions emerge from an analysis of these pitfalls and serve as the basis for the future design of evaluations:

- Each new medium should be carefully examined to determine the types of communications which it might provide if it were in general usage. This analysis should be preferred over the simple substitution of a new medium for an old one.
- Group, task, and personality factors should be carefully considered as a part of teleconferencing evaluations.

- Laboratory methods are sometimes useful in social evaluation of teleconferencing systems, but they should probably be used in conjunction with field tests.

- Extended-term tests with the same or similar groups are perhaps most promising. Such an approach improves each group's ability to evaluate the communications media they are using.

- Whenever possible, common sets of questions for gathering information about teleconferencing media should be used, but a "universal" questionnaire is unlikely.

- New teleconferencing systems should be designed to gather usage statistics on group interaction patterns unobtrusively.

These suggestions and the preceding pitfalls have involved judgments on my part, based on my experience to date. They are not, however, fully validated. Social evaluation of teleconferencing is, in a real sense, just beginning. The suggestions above are intended to encourage the development of more sophisticated approaches, but they will need to be revised and expanded as the social effects of group communication through electronic media become more fully understood.

Notes

1. For general surveys of social evaluation for teleconferencing systems, see Gerald C. Bailey, Peter G. Nordlie, and Frank Sustrunk, "Literature Review, Field Studies, and Working Papers," Arlington, VA: Institute for Defense Analysis Paper P-113, October 1963; revised March 1966. (NTIS #AD-480 695). This paper from the IDA studies of the early 1960s makes it clear that very little social science research has been directly related to communications via electronic media. For a broader historical perspective, see Gordon Thompson, "Moloch of Aquarius," *The*, February 1970, which describes basic characteristics of communications revolutions and provides a broad context for social evaluation work. For a more recent survey and analysis, see Alex Reid, "New Directions in Telecommunications Research," report prepared for the Sloan Commission on Cable Communications, June 1971 (also abstracted in *On the Cable--The Television of Abundance*, New York: McGraw-Hill Book Company, 1971).

2. Computer-based teleconferencing is a medium of communication which allows all participants to type their comments from standard computer terminals, usually connected by telephone to a computer network. It is a bit like a continuously transcribed conference telephone call, except that there is no voice channel and all the participants need not be present simultaneously. For more detail on computer conferencing, see Vallee, Johansen, Lipinski, Spangler, Wilson, and Hardy, *Group Communication through Computers*, Report R-35, Institute for the Future, 1975. This report also contains a 200-entry bibliography which deals largely with social evaluation of teleconferencing media.

3. Anna E. Casey-Stahmer and M. Dean Havron, *Planning Research in Teleconferencing Systems*, McLean, VA: Human Sciences Research, Inc., 1973; see especially pp. 79-81. The work of Communications Studies Group in London supports this general conclusion, though with some qualification. In particular, the video channel provides a feeling of "social contact" not possible through an audio-only system. (See *The Effectiveness of Person-to-Person Telecommunications Systems: Research at the Communications Studies Group, University College, London.* Long Range Research Report 3, British Post Office Telecommunications, May 1975, especially p. 45.) Thus, for some tasks, the full video could be desirable or even necessary, but again the decision of whether or not to use full video would certainly be influenced by cost. Many of the CSG reports are available from the British Post Office Telecommunications, TMk 3.3.1, Room 120, 2-12 Gresham Street, London EC2V7AG, England.

4. Edward M. Dickson and Raymond Bowers, *The Video Telephone, A New Era in Telecommunications*, National Science Foundation Report NSF-RA-S-73-004, 1972.

5. Rudy Bretz has developed what is perhaps the most precise map of basic characteristics of electronic media. These include such possible attributes as audio, visual, still, print, semimotion, and various combinations of these. See Rudy Bretz, "A Taxonomy of Communications Media," Santa Monica, CA: Rand Corporation, R-697-NLM/PR, January 1971.

6. Claude E. Shannon and Warren Weaver, *The Mathematical Theory of Communications*, Urbana, IL: University of Illinois Press, 1949.

7. For example, Robert F. Bales, *Interaction Process Analysis: A Method for the Study of Small Groups*, Cambridge, MA: Addison-Wesley Press, Inc., 1951. Other such resources are listed in the bibliography of Vallee, et al., op cit.

8. A more complete discussion of the issue of taxonomies for group communication through teleconferencing, as well as descriptions of current approaches to social evaluation, is contained in Robert Johansen, Richard H. Miller, and Jacques Vallee, "Group Communication Through Electronic Media: Fundamental Choices and Social Effects," *Educational Technology*, August 1974. A workshop summary is also available from Institute for the Future on request.

9. C. Edward Cavert, *Procedures for the Design of Mediated Instruction*, State University of Nebraska Project, 1972 (available from University of Middle America, P.O. Box 82446, Lincoln, NE 68501).

10. See S. Roxanne Hiltz, "Computer Conferencing: Assessing the Social Impact of a New Communications Medium," for presentation at American Sociological Association Annual Meetings, August 1976.

11. See, for example, Alphonse Chapanis, "Interactive Human Communication," *Scientific American*, March 1975, p. 36. This article summarizes much of Chapanis' work to date.

12. This situation is analogous to the n-body problem in physics, in which description of two-body interactions does not reveal anything about three-body or n-body interactions. See Johansen, Miller, and Vallee, op cit., for more detail on this problem.

13. Rudy Bretz, *Two-Way TV Teleconferencing for Government: The MRC System*, Santa Monica, CA: Rand Corporation, Report R-1489-MRC, April 1974, p. 94.

14. Hilary B. Thomas and Ederyn Williams, The University of Quebec Audio Conferencing System: An Analysis of User's Attitudes, London: Communications Studies Group, P/75190/TH, July 1975.

15. Ederyn Williams and Susan Holloway, The Evaluation of Teleconferencing: Report of a Questionnaire Study of User's Attitudes to the Bell Canada Conference Television System, London: Communications Studies Group, P/74247/WL, 1974.

16. James H. Kollen and John Garwood, "Travel/Communications Tradeoffs: The Potential for Substitution Among Business Travelers," Bell Canada, Business Planning Group, 620 Belmont, Room 1105, Montreal 101, Quebec, CAnada, pp. 1-2.

17. Martin Elton, Evaluation of Telecommunications: A Discussion Paper, London: Communications Studies Group, P/73145/EL, 1973.

18. Barry Stapley, A Comparison of Trials of Teleconferencing Equipment, Communications Studies Group, P/74244/ST, 1974.

19. One interesting approach to gathering such information, developed by Ederyn Williams, is to identify "communication chains." Williams asks respondents to think of a recent communication. Then, the respondent follows that communication back in time to identify links, listing them until the chain ends or his memory fades. For each link, the following information is recorded: communications medium, whether the respondent was the sender or receiver, length of the communication, and function performed. In this way, information is gathered about the way people communicate and the tasks which are matched to each medium. Used periodically, results could also show whether substitution of one medium for another had occurred and whether new types of communication had emerged. The method is still not fully developed, but it is indicative of the kind of creative measurement approaches which need to be developed. See Ederyn Williams, Communications Chains: A Method for Tying Down Generation Effects and Other Beasties, London: Communications Studies Group, S/75135/WL, 1975.

20. The questionnaire is contained in Ederyn Williams and Susan Holloway, The Evaluation of Teleconferencing: Report of a Questionnaire Study of User's Attitudes to the Bell Canada Conference Television System, London: Communications Studies Group, P/74247/WL, 1974.

21. A copy of the draft questionnaire is available on request from the Institute for the Future.

22. Roger Pye, Brian Champness, Hugh Collins, and Stephen Connell, The Description and Classification of Meetings, London: Communications Studies Group, P/73160/PY, June 1973.

23. Permission for use of this scale can be provided by contacting Roger Pye at Communications Studies Group, Joint Unit for Planning Research, Wates House, 22 Gordon Street, London WC1H 0QB, England.

THE AMPLIFIED TELEPHONE PROGRAM AT STEPHENS COLLEGE

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From 1958 to the present, Stephens College, in Columbia, Missouri, has used the amplified telephone as a means of adding to the substance and range of the classroom. We have found the procedure highly successful and somewhat disappointing, inspirational and defeating, popular and esoteric, efficient and chaotic, essential and a luxury, worth the money and beyond our means.

In the beginning for us, when Professor James Burkhart of our Social Studies Department set up a telephone in his American Government classroom so he could bring in the voices of political figures, the simple but effective device created excitement among our experimenters in education. With a microphone on a table in the center of the room to pick up student questions, Professor Burkhart talked with his guests on an ordinary business phone--such notables as Senator Robert Taft, Harold Stassen, Norman Cousins of the Saturday Review, governors, leaders in labor and business, women in state politics. The next year, 1959, Stephens added three other courses in the experiment: Modern Business, Basic Beliefs, and Masterpieces of Literature.

In 1963, the College received a grant from the Fund for the Advancement of Education to try a program including a group of small, liberal-arts colleges, with special attention to those predominantly Black. The first to participate were Jackson State College, Jackson, Mississippi; Tougaloo Southern Christian College, Tougaloo, Mississippi; Grambling College, Grambling, Louisiana; and Southern University, Baton Rouge, Louisiana. During the seven years of the program, it reached representatives of over 40 institutions in Missouri, Texas, Oklahoma, North Carolina, Ohio, Georgia, Kansas, Tennessee; about two-thirds of the colleges were predominantly Black.

At first, we used the conference-call system of the telephone company, with the operator in St. Louis. Because of all the lines bridged into the network, the noise of one was transmitted to all: the squeals of feedback, the ringing of other phones, the strange voices entering our system. Finally, General Telephone Company installed a small switchboard in the Stephens classroom; there, our own technician acted as conference operator to monitor and control each line. Each college had the portable conference set to install and control--and to cope with.

We provided a "master teacher" to organize and lead each course; each college provided a classroom teacher. In the beginning, the technical and cultural difficulties nearly destroyed the program: when we opened all the lines for spontaneous discussion, they became so weak we could not hear each other. Consequently, we arranged an order of questioning, each college taking a turn. Quickly, we found that six colleges on the line, including Stephens, were about the limit--any more became too many when we wanted all of them to have a chance with questions. Too often, in those days, the system broke down: we were cut off, static drowned out individual lines, some faded for no apparent reason, some garbled the voices. As the years went on, the equipment improved until, at the end of the extensive programs in 1970, we were able to leave all the lines open at the same time, to interrupt each other at will, to hear everyone clearly.

The cultural differences sometimes put the courses in a sluggish mood, and yet sometimes caused good fire of excitement in the classroom. Because of their poor (in both senses of the word) background, the Black students tended to ask some obvious questions; on the other hand, often those students added the vitality and fascination of their own experiences. When, for example, we talked with poet and playwright LeRoi Jones (Imamu Amiri Baraka) in our Black Literature course, and psychiatrist Price Cobbs in our Black Culture course, we heard verbal explosions from the students: the arguments reached the shouting stage, and then subsided--for good effects.

Part of some of our frustration came from the sense of blindness: the students could not see the speaker (we have, in recent times, experimented with the "phonovision," or the "pictophone"; if ever the cost can come down to earth, that device can be a significant answer). We sent out slides and portraits to show in the classroom; they helped a little. In addition, we provided biographies of the guests; the master teachers presented backgrounds, discussed elements of the books of the course, most of them written by the guests (who were, naturally, pleased at the selections). At times, we had some trouble with student participation: either they asked too many questions or they had none. Some schools felt slighted, others "passed" when their turns came. We established a routine of students handing in questions to the classroom teacher the period before the talk with the guest; from them, the teacher selected the best questions. During the conversation with the guest, the teacher then had the students read their own questions. Others occurred spontaneously from the discussion, so that method worked well as a catalyst, an ice-breaker, a way to stir the students from their hesitations and shyness.

Occasionally, we sensed that some classroom teachers felt jealous of the dominance of the master teacher; others at times relied too much on him or her; most appreciated the knowledge and direction. The master teacher had to be strong in controlling the conversation, in keeping it going, in making it a relaxed and yet important hour. Usually, he--or she--lectured for 15 or 20 minutes twice a week, then took questions and comments for the rest of the 50-minute period; the third weekly meeting brought in the guest speaker.

We were able to obtain almost all the guests we chose: they had to prepare no talk but only to converse, answer questions, and from any telephone anywhere they wished (living rooms, kitchens, offices, vacation spots, even a bedroom, even a pay phone in Puerto Rico). At first, when we had grant money, we paid each guest an honorarium of $100. Later, we had to reduce that to $50. Because they felt they could be of service, and especially to the Black colleges, the guests were willing. In literature, they included such writers as John Dos Passos, Ralph Ellison, James T. Farrell, Anne Sexton, Richard Wilbur, Saul Bellow, John Updike, Archibald MacLeish, Katherine Anne Porter, Joseph Heller, John Cheever, Wright Morris, James Dickey, William Inge, Philip Roth, Kurt Vonnegut, Robert Penn Warren--among others. In the "Great Issues in Contemporary Society" course, among the guests were Margaret Mead, Ralph McGill, Henry Steele Commager, Ralph Bunche, Max Lerner, David Riesman, Barbara Ward. Like figures spoke to us in the courses in the philosophy of science, cultural change (an anthropology study), political issues. Without exception, the guests praised the programs, often expressing surprise at their own enjoyment in taking part, and encouraged us to continue.

Above all, the students felt the presence of the voices of the guests. That writers, poets, scholars, politicians are humans with emotions rather than disembodied creatures jolted the students to realize in a profound way that written material is not sacrosanct--and that expression has experience and purpose behind it. Most of the colleges could never afford lectures in the flesh by the guests; the amplified telephone provided conversations with the best. Furthermore, the master teachers, with their closely-constructed programs, presented studies that many of the colleges could not offer.

However, the provision was luxurious. Each college submitted $3500 a year to pay for all the costs, the installation charges for the equipment, all telephone charges, honorariums, materials. In the early years, we ended with surpluses that we returned to the colleges. Later, we teetered on the edge of expenses, and finally we fell into the red. When, in 1969, the Government began to cut down on grants, when the foundations gave fewer funds for experimentation, let alone for basic education, when, for the Black colleges especially, the money disappeared more than ever, the amplified-telephone program withered and finally, by 1971, died.

At Stephens College, we continue the operation of our equipment. Now, rather than using it regularly, teachers of various courses make occasional calls to guests. In addition, groups such as the alumnae organization use the amplified telephone to meet by voice two or three times a year.

While we agree that nothing replaces the teacher in front of the class, everyone in the program appreciated the opportunity of talking with the guest speakers, the scholars, the authors, the professionals. As some of the classroom teachers said, the time was "exciting and dynamic," "outstanding," "tremendously educational," "extremely valuable." About the literature course, for example, one said, "It gave us all a sense of the great web of relationship between literature and life." On those notes, we may claim the amplified-telephone program worth the exhaustion of the preparation it demanded and the battle against the frustrations of the medium. When money becomes real once more, we hope to return to the future of the experiment.

CASE STUDY OF A PIONEER SCHEME FOR TELECONFERENCING IN LONDON
Open University course: Faculty of Arts; The Age of Revolutions

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The basic aims of the British Open University, to provide university education to those with keenness and ability who are unable to attend a conventional institution of higher education, are too well known to need re-stating here. Consequently, it is not really surprising, but nevertheless worth stressing, that in attempting to give that chance -in some cases, a second chance- to men and women who would otherwise miss it, the Open University shows a special awareness of the plight of disadvantaged, i.e. housebound, isolated and more especially disabled, students within the community.

When it was suggested in 1973 that I might want to participate in the proposed new scheme and tutor the first series of 'conference calls'[1] or 'teleconferences' I was delighted to be able to contribute something positive towards the academic welfare of these students, but it is only fair to add that I also had some misgivings. From the first, I was acutely aware of all the difficulties involved.

The course selected for the experiment was one with which I was already familiar, having taught it in conventional face-to-face university situations. Called The Age of Revolutions, and encompasing roughly the period 1750-1850, it involved such disciplines as history, literature, philosophy, visual arts and music.

Obviously the use of a telephone as medium of communication would mean a complete reappraisal of the presentation of the course material. This would have to take into account, not only the limitations resulting from the absence of visual channel, but also the additional constraints created by the students' respective disabilities. At this stage, it became evident that, while part of the proposed scheme would call for precise advance planning, a number of imponderables would remain, which could only be dealt with when the course was actually being taught.

As it turned out, the disabilities of the first group of students were indeed very different in nature. Two were blind, one who had progressively lost his sight as the result of an illness used tape recordings for his work while the other, blind from birth, was trained in Braille. Two were partially crippled, one with the added difficulty that she was hard of hearing... This seemed quite insoluble at first but in fact caused no interference once her telephone receiver had been fitted with an amplifier. The remaining three students presented fewer problems, one was a paraplegic, another a mother unable to leave her severly spastic daughter, and the last, a young man living too far from any Open University study centre.[2] One complication with blind or crippled students might well be that of note taking during the teleconference, but I felt that, in any case, I would discourage it very strongly, as it would tend to increase the students' passive role as recipients of information while hindering the active response and the contribution to the discussion which must surely be the essential components of a successful tutorial session.

To assist their work, students of the Open University receive a number of documents at intervals during the academic year. These include printed correspondence texts called Units, one for each discipline within the course, usually written in a 'programmed learning' style as well as supplementary material relating to the associated radio and television broadcasts. Students are also given a list of set books to read, a folder of illustrations relating to the Arts Units and gramophone records to be used in connection with the music Unit.

Consequently, my role as a tutor for The Age of Revolutions consists primarily in helping the students to understand and learn from the course, either by providing additional information, perhaps putting forward a different viewpoint in connection with some of the questions raised in the Units, or occasionally just summing up information disseminated among several Units. (Incidentally, it is also part of my brief to mark the essays written by the students in my group and to guide and advise them generally[3]).

Prior to each group meeting, a topic for discussion is agreed upon so that all students have an opportunity to make some preliminary research and contribute more effectively to the general discussion. At the beginning of the meeting, I spend some time introducing the topic, trying to use as varied a presentation as possible, firstly to suit each particular aspect of the course and secondly to promote interest and offer some sort of challenging approach. This may last some twenty to twenty-five minutes and students are of course free to interrupt at any time in order to comment or ask questions. The second half of the period is then taken up with a general discussion where I remain as unobtrusive as possible.

When I came to think in terms of translating this into a teleconference situation, it seemed clear that, at least as far as some parts of the course were concerned, it would lend itself to some simple and indeed very interesting adaptations.

For example, short extracts of poems pre-recorded on tape would come over the new medium quite satisfactorily and enliven talks or discussions on Blake, or on Goethe (studied in translation). Musical extracts pre-recorded in the same manner would be as simple to use here as in study centres. Discussing painters and cartoonists of the period might well prove more complicated but, in as much as students already had in their possession all the necessary illustrations, careful advance briefing and numbering of plates would prevent time-wasting rummaging around and confusion. The main difficulty would in fact be limited to the two blind students on the course, and be the result of their disability rather than that of the communication medium used. Consultations with senior course advisers resulted in my being given carte-blanche to organise these students' work on the two Units concerned (High Art and Art and Politic) and to send them whichever essay topic I would consider suitable. Subsequently, this was worked out in close consultation with the two students who solved the various problems themselves. The young man, who was able to identify colours and still remembered seeing pictures, was eager to do the same work as sighted students, with the help of a relative who would describe the various illustrations in detail. The girl, on the other hand, expressed a wish to undertake supplementary readings in connection with the historical and critical factors which had influenced High Art and the reaction to it (painting techniques, innovations, return to classical inspiration, etc.,) She wrote an essay on this and, in addition, proved to be the most interesting and valuable contributor to our discussion, bring a totally new insight into the subject.

Other components of the course, especially the straightforward talks on history and philosophy (including Immanuel Kant's epistemology and ethics!) called for a meticulous advance preparation.

There again, I aimed at a presentation of some twenty-five minutes, divided into three sections (we shall see why), planned carefully so that the salient arguments could be put forward in a clear, easily remembered form. These 'mini-lectures' meant in effect a series of private rehearsals, when I used my tape recorder to verify the timing of the talk and ensure that the sequence of historical events or the trend of philosophical thought would emerge simply and coherently.

So much for the purely practical academic presentation of the course material. There remained, however, other crucial factors to be considered. These, mainly psychological in essence, were far more difficult to assess, let alone obviate, and yet they were obviously of the utmost importance for the success of the venture and, far more significant as far as I was concerned, for the happiness and fulfilments of the group of students involved in the experiment.

Some of these factors were inherent in the very nature of the medium selected, with its impersonality, limitations, etc., others were directly related to the students' own disabilities. A number of careful studies have been made with regard to the problems of teaching without the visual channel. Dr. John Short, himself, has written an interesting report[4] in which he comments upon the difficulty of communicating in the absence of commonly used non-verbal signals (physical appearance, facial expressions, gestures, etc.,) and the resulting loss of positive interaction, personal contacts and/or human satisfaction, to say nothing of the chaotic situation which would result at once if several participants attempted to speak at the same time, or if someone "held the floor" at great lengths while others were ignored...

This is why it seemed essential at the outset, to approach the students initially (by telephone) separately, and as individuals, so that a certain familiarity and trust could be generated, and so that the concept of the project could be explained to them in detail. Realizing how daunting it could be for them to think that they would be expected to participate actively, ask pertinent questions, make brilliant comments off the cuff... I took the unexpected step of telling them that there was no need for them to ask or answer any question if they did not wish to, because there was in any case substantial benefit to be derived from just listening. I added of course that if they had any questions to ask, these would be fully discussed and answered, and if they wished to make any comment, they would have a chance to do so. This went a long way towards making the students relaxed and feeling at ease when the time came for the first tutorial, so that they were at their most receptive to what was said and most ready to participate. In the event, questions arose normally from the topic covered and a spontaneous discussion was effortlessly generated.

I also worked out the various phases of each session, taking into account my role as 'chairman' -if that is not too formal a term- and indeed a very satisfactory pattern seemed to emerge from the start. I began, each time, with an introductory greeting for each of the students, in alphabetical order, calling them clearly by name and adding some small personal remark whenever possible, perhaps about the week-end one had just spend with friends, or a birthday, or the guide-dog's latest training course, first to make sure that their telephone lines were working properly and that they could hear and be heard by everyone else, but also to get them to know one another as persons with a separate existence outside the short hour we spent together, to identify their respective voices, and finally to memorize their alphabetical order in the conversation. This order varied from time to time, if students missed a conference, because they were away, unwell or indeed back in the hospital, although our crippled student, a very determined person, managed to coax her hospital into allowing her exclusive use of the television set in the early morning for Open University broadcasts as well as use of telephone for the conference calls!

The alphabetical order could have been based upon their family names if they had wanted to be addressed as Mr., Miss ..but I was pleased when they indicated a preference for first names in the more informal university manner, and so the alphabetical order followed from the first name's initial. I also volunteered my first name but noticed that they were reluctant to call me anything but Dr. Evans.

It will be remembered that eight participants are usually grouped for such an activity and it may be worth mentioning that a Post Office operator stands by, throughout the call, ready to improve reception, substitute better lines, etc., to ensure that nothing goes wrong while the talk is in progress.

Proper discipline is evidently essential at all times if coherence is to be maintained and if each student is to have a chance to speak uninterruptedly, to be answered or further questioned by all other students in turn, and so on. Experience had shown that this is best achieved if one adheres rigourously to the preselected alphabetical order, whenever any discussion takes place, metaphorically speaking, around the table. Occasionally, when a point had been discussed and we seemed to be ready to pass on to the next one, I would ask whether anyone had anything more to say. At this stage, there is little danger of a sudden cacophony, but one student may well want to come back; identification should come first in that case and if it had been forgotten, I simply said: "This is you, Jane, isn't it?"; after a few times, I noticed that some student would occasionally ask the question before I did. Such moments did not lessen the general discipline but they contributed to the informal atmosphere and ensured that each student appeared to the other as a real personal and not just an disembodied voice remote from any human connections.

In the absence of any direct visual feedback concerning students' reactions to my talk, the two planned intervals acquired great importance, because by using the round table system outlined above, I was able to find out from each student in turn whether everything had been clear so far, or whether what had been said called for questions or further comments. Responses varied greatly at that stage, on account of the topic certainly but also because some students seemed to gain confidence as more information was given to them and they began to remember what they had read previously. At the end of the talk, they had usually become so involved that they were not at all self-conscious and a wide ranging number of questions, together with interesting additional information was readily forthcoming.

This was the moment when chairmanship became somewhat involved. I called the first person on my 'alphabetical list' in order to ask for his (or her) question or comment on the topic as a whole, after which I addressed every other student in turn for comments on that particular contribution, giving the initial speaker a chance to reply, always referring to each student directly, by name. An identical procedure was followed for the second and every other name on my 'list'. This was undoubtedly the most taxing part of the tutorial with the need of keeping ahead of the conversation, not losing the thread of what was being said, yet remembering the state of play, so to speak, so that no one was left out. To give a true picture, I should perhaps add that this was not a very formal or frightening exercise. Any tension I felt did not appear on the surface and the exchanges were completely free and easy, sometimes with a touch of humour or even some laughter... On the other hand, I was always prepared to take kindly, at its face value, the statement that a student had nothing to say. If there was any danger of his being embarrassed by it, I would probably comment that I felt the same since the previous speaker had made the point very well, which was often no more than the truth.

Towards the end of the hour, I would see if we could reach some sort of collective conclusion and, if I felt that it was needed, I would attempt a brief summing up. The last few minutes were reserved for the mention of the next topic and for suggestions concerning useful preliminary reading after which, still keeping to the alphabetical order which had by them become second nature, students were free to chat to one another until our time was up and we took our leave. A number of telephone calls followed in the wake of each teleconference.

Indeed a pattern of individual contacts took shape as the course progressed. Students exchanged telephone numbers and kept in touch with one another. They were also eager to talk to me. I believe that I said once, jokingly, that if a list were made of the drawbacks of the new scheme, the lengthy telephone calls received from students would have to go right at the top. There is no doubt that such disadvantaged students, often lonely -if not physically, at least intellectually- are keen to exchange ideas and that they have a great need for individual contacts which I personally find most rewarding.

While it did not happen with that initial group of students, I have since received telephone calls from members of some of "my" disabled students' families, either because they wanted to know in what way they could help, or because they were worried about the student's intense concentration on Open University work, or even for more personal reasons.

It is therefore possible to draw some conclusions from the experiment. Non visual communication systems such as the wireless or the telephone have certain recognized instructional advantages over other media. Added concentration prevents digressions or irrelevancies, while leading to a real improvement in the retention of imparted information[5]. In addition, there are factors which make telephone group discussion especially satisfying, for instance the 'democratic' feeling resulting -somewhat paradoxically- from the chairman's increased authority in the absence of visual interference, because under his direction, everyone is given the opportunity to contribute to the discussion. All these advantages were very much in evidence in the teleconferences in which my students and myself took part. There could be no doubt as to their usefulness both for learning purposes and for promoting constructive discussion.

More unexpectedly, however, the psychological inhibitions normally resulting from non visual communications were markedly absent from our gatherings and this was, in my opinion, due to two factors: The students' strong motivation towards academic pursuits, desire to learn new things, explore new areas of knowledge rather than just get through examinations and also (perhaps even more important) the fact that they were disadvantaged. In their case, usual constraints and limitations emerged as positive advantages.

They created a social unit which became stronger as time passed. The absence of visual feedback usually felt so acutely where interaction is essential did not hinder them but became a beneficial element. It was immensely encouraging for them to feel that despite their social condition, or the nature and extent of their disabilities they were on equal terms on the telephone. They were free to enjoy fully the social occasion as well as the intellectual stimulus. Feelings of frustration or isolation were prevented or alleviated, not only where our Open University course was concerned but in a much wider context. The satisfaction afforded by these teleconferences was manifest, just as evident in fact as their academic value.

It was certainly a privilege, as far as I am concerned, to have been given the opportunity to participate in this pioneer scheme, to have been instrumental in giving so much joy to the students and to have received so much from them.

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FOOTNOTES

[1] This is the term used by the General Post Office for the service whereby a maximum of eight telephone lines are linked up simultaneously so that each participant can hear all the others.

[2] This was not the case here, but it may be worth mentioning that some *Open University* students are prison inmates, and teleconferences represent their only means of receiving tutorial help.

[3] This is, at least in principle, limited to academic matters. For others, students have a counsellor allocated to them.

[4] Short, J.A. (1973) *A report on the use of the audio-conference facility in the University of Quebec*. Communications Studies Group, University College, London.

[5] Short, J.A. (1974) "The problems of teaching without the visual channel" *Teaching at a distance*, I, 1.

TEACHING WITH THE TELEPHONE - A CLASSROOM INSTRUCTIONAL TOOL IN A COMMUNITY COLLEGE

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The use of the telephone as an instructional tool is in principle little different from the use of any other electronic medium as an instructional tool -- it can be used either as an adjunct to classroom instruction or integrated into classroom instruction. Experience in the use of electronic media as instructional strategies and in observation of their use by others confirms the notion that any medium should be part of, and not added onto, both the subject matter and the teaching strategies. The medium is, indeed, the message. The most important elements in building a medium into the instructional program are that the instructional goals and objectives be determined, that the instructor take the medium seriously, and that he/she build the medium into instruction in such a way that the subject matter and the medium are interrelated, and that the student's interaction with both is tested and reflected in the student's grade. It is important to recognize at the outset that there is a difference between having an occasional telelecture to reinforce a point in a course or to serve some other purpose, and having a telelecture be an integral part of the course, a mode of instructional delivery around which the course is built. It is with this last mode of instruction that we are concerned here.

My experience with telelectures covered several years and has been followed by other kinds of experience in using other types of electronic media in teaching. The same general maxims hold true for any other electronic medium well used. There must be much advance planning of goals and objectives to include such integration; the instructional strategies, the physical and the technical logistics of the program must be organized into a time frame well in advance; there must be a system for finding what in television is called the "talent"; there must be a budget for telephone and talent which sets parameters for what can be done; and a method of evaluation by students must be worked out. In this paper I should like to deal primarily with these elements involved in structuring a telelecture course, a kind of how-to-do-it approach, by describing a methodology which seemed to work.

Two points should be made at the outset. In the use of any electronic medium the medium should be selected to suit the instructional purpose. It should be first, appropriate to the task and second, it should fit into budgetary limitations. All of us in this age of rapidly expanding use of technical equipment, especially in telecommunications, are aware that subject matter is sometimes molded to suit the medium or even to suit a new building, whereas the medium should be selected to work with and enhance the subject. The tail can wag the dog. There are certain kinds of subject matters which do not lend themselves to a medium which may be currently in vogue. There are times when an inexpensive carousel and a slide-tape may be instructionally as effective as a much more expensive medium. Kinds of audience, instructional purpose, costs, must all be considered. The telephone conference call is no exception.

Budgeting for our program was done, using the operating budget, through normal channels by the campus dean and included the cost of the conference telephone equipment, on which we got a monthly rate, the costs of the telephone call, and the guests' honoraria. All the other work was done by me as the course instructor, including the typing of correspondence and the biographical information sheets, for mimeographing by the college operator.

I believe that new or different teaching strategies should be funded whenever possible within the operating budget of an institution so that the program is not abandoned or left hanging when outside funding disappears. This requires advance budgeting planning and administrative acceptance. Institutions can be left with embarrasing expensive unused hardware if continuation of its use is not part of long-range planning, grant money dries up, or key personnel move away or lose interest. Any mediated instruction is only as good as its software anyway. The telephone as hardware is safe because if the program runs out of steam you have a relatively small equipment investment.

We found the telephone a relatively inexpensive way to bring important people to the campus without their having to move from their offices. Hence it made possible conversations with people we could never have afforded otherwise as speakers and who could not have come to the campus because of distance and time. The telephone conquered these elements for us -- distance, time, cost. Our geographic location near Washington provided a rich local human resource on many topics "just downtown". On the other hand, telephone conference calls require the development of listening skills by the students, which means that students must be prepared beforehand so they know what to listen for. The use of this kind of instruction requires a high degree of detailed organization by the teacher in addition to what used to be called dedication, which simply means spending a lot of time and energy to get it all together. It is an instructional mode which requires of the teacher some experience or awareness of how to ask meaningful questions in a limited time on the telephone and how to keep discussion and dialog to the point and moving. The burden of teaching does not automatically pass to the guest speaker. The classroom teacher who manages the telelecture course must have the organizational expertise and the self confidence to talk with well-known people easily and without being awe-stricken, to plan in advance, and to execute a plan in the framework of the speaker, the medium, and the students, keeping them all in balance. For a course based in telelectures you need, then, to determine if the telephone is the right medium for what you want to do, if you can afford it, and if the instructor involved has the kind of skills in organization, managment, and planning to juggle all the elements involved and do what amounts to a great deal of hard work at a high energy level.

Having made these points, I should like to proceed to more specific applications which may be useful to others in planning contemplated telelecture courses. First, however, you will need to be filled in on the student population involved in the program described here, the nature of the course work, and the rationale for using the telelectures.

Our program was modest and simple. Many community college students are underachievers in English language skills. They enter with negative self images and a background of not having liked high school English if writing was involved. This viewpoint emerged repeatedly over some years as expressed in student essays written upon entry to freshman English about what the students' feelings about high school and English were. Many dreaded the thought of a course in English composition and were convinced it would be difficult and uninteresting. I was not concerned about making it easier, but it became a goal to see if the use of the telephone would alter, preferably improve, the attitude that many of the students had when they first entered the course. Some students think of a course such as English composition as something you live through but which has little relationship to life goals or to the "real world" of work. It followed then that one of the goals of the introduction of a new teaching strategy was to use the telephone to make the course work seem more interesting by using a medium familiar to the students who, at this collegiate period in their lives, spend long hours on the telephone talking or listening to friends they have just left an hour ago at school. In the American world the telephone sometimes appears to be an extension of one's arm! Another goal was to try to use the medium in such a way that the teaching of traditional thought and writing patterns in freshman composition would raise the level of the student's consciousness about the relevance of the classroom work to his/her vocational and life experience. We would try to use the medium in such a way that the subject matter of the course was more clearly related in the student's mind to the real world by bringing that world into the classroom itself through telephone conversations with successful people. The basic thrust of the course work was that the student learn to apply to writing a process, a way of thinking, to learn to consciously analyze and synthesize ideas, to organize them and to express them in writing. Other mental skills were also involved -- reading for analysis and for models of the analytical process in the writing of well-known authors or professional people; and listening analytically and responsively, a skill essential to college survival and to thoughtful citizenship in a highly auditory world. The acquisition of these skills was evaluated by writing expository or analytical papers in meeting course objectives.

The goals of the effect of the use of the telephone as a teaching strategy were evaluated by a pre-course statement on attitudes toward English and compared with a post-course statement. At the end of the telelecture courses, according to papers written on the pros and cons of the use of the telelecture, the students were universally in favor of the teaching strategy and thought it made their course not only more meaningful in terms of insights about themselves but also in making the course more relevant to their lives by establishing the connection between the classroom and the world of work outside.

The goal of observing student response to using a hard medium in a reading and writing course was observable in their interest, in their sustained attendance, and in the feedback from the papers which they wrote about the use of the telephone in this way. Many described the advantages to themselves and to the college and there was nearly total agreement that the course was more interesting because of the telephone speakers and the variety they brought to the course. Our geographic location was to our advantage.

One student commented, "Surely, a fifty-minute personal conversation with Louis Cheskin, president of the Color Research Institute, who could receive two-hundred dollars for such a service, is a bargain at the price of the phone call alone! Similarly, ten cents seems an impossible sum to pay for a fifty-minute conversation with Bill Gold or Art Buchwald, renowned columnists for the Washington Post. Under what conditions could a student expect an audition with Walter Harding, the acclaimed Thoreau expert, or Dr. Ernest Dichter, expert in Motivational Research? Much more, the student actually has an opportunity to personally direct his questions to the authority being interviewed. This opportunity provides a much more varied educational experience than can be provided by textbooks or other instruction. It permits a student to "meet" prominent persons he could otherwise never meet."

Now to the kinds of elements involved in organizing the telelecture course. The courses were standard college offerings. Students were prepared for the use of a teaching methodology with which they were unfamiliar by listing the courses with other courses in the course schedule but starring the sections to indicate they were telelectures. Explanations were made at the outset of the courses so that they would understand the procedures and the differences from the more traditionally taught courses.

To avoid the criticism that a course was changed and not parallel to other similar courses, the standard course syllabus used by all other instructors was retained and the point was made that only the teaching strategy was different. The telephone was built into the already existing course in such a way that the effect would be smooth and one of wholeness, that all the elements were integrated. The course syllabus was divided into units which dealt with each process of thinking, reading, writing that the student was expected to master.

The composition courses in which the telephone was used were a first semester course in expository principles and a follow-up second semester course in greater in-depth analysis of reading and writing with some emphasis on analysis of propaganda techniques used in advertising, and a research paper. The textbook contained essays for analysis. Many of them were contemporary writers.

In the first semester the topics involved such processes as definition, comparison and contrast, classification, cause and effect. The textbook which introduced the student to these processes was good but pedestrian. To relate the processes to more than just the daily class work, telephone lecturers of some importance were asked to talk to the class about their use of these resources in their professional work. One would show, for example, how definition of a task, or of a concept in a professional proposal were essential in the real world. The use of computers is an example of an area in which definition is particularly pertinent, as was the task of defining and programming each element in the Apollo space program. Hence, in this instance the telephone lecturer could be anybody who could interestingly show the class how the use of definition was essential in his work.

The same approach was used in making other process relationships -- the use of classification in geology, or of cause and effect in various fields, science and industry, for example. The course work in this semester was planned well in advance so that the telephone speaker would be prepared and his ideas could be integrated into the program.

In the second semester, the text was a book of readings which were analyzed before the students did their writing. The telelecturer might be the author of the reading assigned to a particular unit, or someone who could cast further light upon the subject dealt with by the particular writer.

The mode of instruction was to meet the class for a lecture or for a telelecture in a large group lecture hall each Monday, followed by small group sessions Wednesday and Friday. The scheduling of the time was critical. If we got course interviewees from the government or from other sources in our area, eleven o'clock seemed the time most convenient for them -- right before lunch. If we called long distance, the time differential could be as much as three hours to the west coast which would make it an eight o'clock conference for the telelecturer. Usually, using time after lunch seemed to be too risky for scheduling business men. The conference calls were not envisioned as presenting any real problems for someone who had to be in another city away from his home base because it was as easy by pre-arrangement to call him from one place as from another. The small group follow-up of the single large conference was designed to clear up questions, fit into student and faculty load patterns, and to keep the student from feeling he/she was always swallowed up in a large group. Having a closer connection with the telelecture course instructor is important psychologically. The telelecturers come and go; the course instructor is always there. Telelecturers were scheduled for alternate weeks in the large group section. On the Monday that there was no telephone guest the course instructor lectured, explaining further the concepts described or demanded by the textbook, and preparing students to make the relationships between the telelecturer and the textual and course materials.

Planning had to take place long in advance because the people chosen for the lectures were busy and might or might not be available on the assigned date, might be out of the country, or otherwise occupied. It was necessary to build a system which would secure "talent". A list of available appropriate telelecture names was developed under each topic applicable in the syllabus. I developed talent files from newspaper clippings, magazine articles, from a variety of sources, including any suggestions sent by colleagues or friends. The talent files were organized according to the person's subject -- for example, aeronautics, music, art, biology, earth science, business, etc., as these subjects might relate to the course materials or be applicable to the course syllabus. It was important in developing the file to have telephone numbers and business and home addresses. These were obtained through the public library's phone book from the guest's city, the telelecturer's place of work, or from such library publications as Who's Who. The names were placed in priority order under the topic to be discussed, so that if one person was not available, there would be others to choose from. A calendar was planned and then the lecturers for each telelecture week were contacted. Our guests spoke to us from California to Cambridge, Massachusetts, and from Wisconsin to Texas.

The instructor, using the talent file, cannot be affected by fear of a person's fame and reputation. To get results, I have long since learned that one goes to the top. Travel first class and try to get the best person. You might just succeed. We often did. If not, we had a second team in our list of alternative people.

The first contact was always made by telephone because it was that medium that was involved. I would telephone the person and persist through a veil of secretarial surveillance and protection in talking to the person himself/herself. During the course of the conversation with the secretary, I would find out about available dates on the guest's calendar. If the person was a big name and our calendar needed to be adjusted a week or so in order to accommodate the guest's, this was done by putting two of my own lectures in a row and two telelectures in a row. Once I got through to the telelecturer I would explain my mission, stressing the importance of the person in his field and why we wanted him/her in particular, and pointing out that the conference call would be essentially no different from the conversation we were now holding. Sometimes a person had an unusually good and clear telephone voice and this too was pointed out. The person was paid a fee of $50 for a maximum of forty-five minutes. I pointed out that if the fee was not of concern that it could be donated to a college scholarship fund and become income tax deductible as a concrete donation. A number of people preferred to do this rather than to add it to their income. The initial contact on the telephone was followed up by a letter of confirmation. The person could either prepare a lecture or I would send a group of questions which I would ask in an interview, and which the students would know I would be asking. Most guests opted for the latter mode of presentation, the interview. The students would then prepare five questions of their own (to be handed in for grade credit) based upon our classroom reading and discussion and its relationship to the telelecture. I have had long experience in group discussion techniques and this skill was invaluable in constructing the interviews. The telelecturer was then sent the interview format with a list of the questions he/she would be asked. The time of the interview was stressed, the telephone number to be called was underscored, and all such small details made clear, including what to do if we were cut off or had some kind of mechanical failure, where and what number we were calling from, a description of the room to be visualized, and the procedures we would follow. Where possible a short biography was procured from each telelecturer and I wrote an information sheet from this information or from elsewhere -- from library research or from newspaper or magazine articles in the talent files. The information sheet was given to the students and to all members of the faculty and the college community, as well as the college newspaper and our public relations officer. The information sheet contained all the particulars of the telelecture, what, when, where, biographical information, and an outline of the questions to be asked and why they were pertinent. Mimeographed on colored paper, the information sheet was distributed in advance of the telelecture so that anyone who wanted to could come . Depending on the speaker we sometimes had a large guest attendance that included students, faculty and community people who could fill in seats behind the regular class groups in the course.

Classroom housekeeping was organized to include matters like taking attendance at the beginning of the session, passing out handouts, etc. We at that time did not have a very strong or centralized campus audio-visual support structure, so it became necessary to make sure that each time we had the telelecture a media technician from another campus was there to monitor the equipment. The class met in a large science lecture hall and the telephone itself was locked in a cupboard in the science demonstration table in front of the room. The equipment was in a small room housing science equipment and adjacent to the lecture hall. The technician stayed there monitoring the conference equipment while I dialed on the telephone in the next room and then shifted ground to a long-corded microphone used during the interview and carried around the room for students' questions. The use of electronic equipment can be frustrating. It requires education of the user and understanding on the part of the technician. Being able to keep one's cool is essential. Connections get fouled up. Small things go wrong in the mechanism. Every detail had to be checked out in a kind of brief rehearsal before the call so that the technology went smoothly. There was always the possibility of having surprises such as on one occasion going to get the telephone from the locked part of the table and finding only a cut cord -- someone had stolen the phone!

Follow-up was of two types: first, with the guest; second, with the student. Each guest was written a personalized letter of thanks commenting on student reaction. If he chose to forego the honorarium for our scholarship fund, administrative details were taken care of. Follow-up with the students included a class discussion of the telelecture the period following it, and sometimes a written or evaluative exercise. As indicated previously, there was also a course evaluation of the teaching strategy at the end of the semester.

During several semesters we tried combining classes for just the telelecture session and involving four other teachers who could carry on during the rest of the week just as they normally would in their class sessions. From this experience several valuable lessons emerged. One is the value of enthusiasm in such an experiement; teachers who were not themselves enthusiastic about the medium did not have as enthusiastic a response from a few students because the teacher did not sustain the student psychologically. One teacher said the course was "too organized; the tempo was not my tempo": it "upset" him to be in a structured course situation. One said he was "too egotistical" to do such a course and did not want to be upstaged by an outside speaker, much less a telephone. All said that to organize the course themselves would take too much time, and they would not want to take over the telelectures. We by then had difficulties in getting the large classroom space which the science people wanted to consider their turf. Having had the telelecture experience for several years, I did not continue the course and assumed other kinds of duties. Since then students from the course have written or returned to tell me that the telelecture approach was an outstanding memory and had permanent effects on their thinking about their community college education. It was successful. It worked for students. This, after all, is the litmus test.

There were anxious monents and funny experiences. You learned a great deal about a person just by hearing his voice and not seeing his face or his body language. Some students thought they learned more by hearing than by seeing the person because seeing him detracted from what he said. We worked on how to listen, what to listen for, and on increasing aural acuity. The students had to learn to ask questions of the speaker that would elicit a response other than "yes" or "no". Sometimes we learned unusual things -- for example, that Art Buchwald's early years were hard and connected with a lace-curtain-making factory. One prominent millionaire political figure asked us not to call him; he would call us long-distance at the appointed time; he was punctilious about reversing the charges. We learned a great deal about a person's ability to communicate and what his voice, diction, and vocabulary said about him. In one instance the guest gave explanations by playing a musical instrument. The spin-off in learning was colorful, sometimes humorous, always stimulating.

As I review the experience in my own mind, I see the telephone lecture as an exciting way to teach that taught me a great deal in turn. The most important lesson was that the medium must be integrated into instruction in such a way that it is either the warp or woof of the learning action, whether it is television, films, or the telephone. It was a great experience to meet all those people on the telephone, exhilarating and intellectually stimulating. It kept me as well as the students from being bored and boring. It was a great experience to know that important people will take time out of their busy schedule to talk to students about their work or to describe the intellectual processes involved and essential to it. I recommend it to anyone who has the energy, the ability, and the unflappability to do it and thank Ma Bell because it was fun.

Some Telelecture Guests

Dr. Issac Asimov, Writer
Dr. Clifford K. Beck, Atomic Energy Commission
Dr. Jessie Bernard, University Professor and Sociologist
Mr. Joseph Betts, IBM, Program Analyst
Mr. Art Buchwald, Columnist - Washington Post
Mr. Charlie Byrd, Musician
Dr. C. Thomas Caskie, Research Physicist
Mr. Alburey Castell, Editor of Crofts Classics
Mr. Willard D. Cheek, General Motors, Public Relations
Mr. Louis Cheskin, President, Color Research Institute
Mr. Araldo A. Cossutta, Architect
Mr. David D. Cram, President, General Programmed Teaching
Mr. Edgar Dale, Professor, A-V Education and the Use of Non-Print Media
Mr. Richard Dennis, President, Great Books Foundation
Dr. Ernest Dichter, Expert in Motivational Research
Dr. Wilson H. Elkins, President, University of Maryland
Dr. Bergen Evans, University Professor of English Literature
Dr. Harold E. Finley, University Professor and Zoologist
Dr. Richard F. Flint, University Professor and Geologist
Capt. Robert Freitag, USN Ret., National Aeronautics and Space Administration
Mr. Frank Getlein, Art Critic, The Washington Star

Dr. Joelyn R. Gill, Astrophysicist,
National Aeronatutics and Space Adm.
Mr. Bill Gold, Columnist, The Washington Post
Mr. Barry Goldwater, U.S. Senator
Dr. Ernest S. Griffith, University Administration
in School of International Communication
Dr. Walter Harding, University Professor of English
Mr. Hugh Hardy, Architect
Mr. Paul Hume, The Washington Post
Dr. Edward T. James, Historical Biographer
Mr. Bernard Kamenske, Journalist, Voice of America
Mr. Plato Karayanis, Musical Arts, Opera
Dr. Charles Kellogg, Soil Survey Chief, U. S. Soil
Conservation Service
Dr. Robert G. Leh, Institute for Mass Political
Communication
Mr. Irving Lowens, Music Critic, The Washington Star
Dr. J. Hoover Mackin, University Professor and Geologist
Dr. Lee E. McMahon, Psychologist, Bell Telephone Company Laboratories
Mr. Maurice B. Mitchell, President, Encyclopedia
Brittanica
Dr. William H. McNeill, University Professor and
Historian
Dr. Edward F. Moore, Mathematician, Bell Telephone
Laboratories
Mr. Gerald Nordland, Art Museum Curator
Dr. Thomas L. Saaty, Government Mathematician
Dr. William C. Strasser, President, Montgomery College
Douglas H. Teller, University Professor of Art
Mr. Wolf von Eckardt, Architectual Critic, The
Washington Post
Dr. Robert M. White, U.S. Government Bureau Chief,
Environmental Sciences
Mr. William H. Whyte, Jr., Author of The Organization
Man

THE OSU CENTER FOR CONTINUING MEDICAL EDUCATION'S EFFORTS TO BRING TWO-WAY INSTRUCTION TO THE HEALTH PROFESSIONS

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Over the past fourteen years, the Center for Continuing Medical Education of The Ohio State University of Medicine has been involved with the production and transmission of several two-way networks for health professionals. In each case, the telephone has been used to permit two-way interaction between the academician and the practitioner.

CCME's efforts have included a TV network for physicians (which operated for ten years), an FM radio network for nurses (which operated for seven years), an FM network for pharmacists (which has operated for six years), and OMEN (the Ohio Medical Education Network) an audio network for physicians.

This paper will examine each of these four networks, but the emphasis will be on the OMEN audio network for physicians which will begin its fifteenth year of service in September of 1976.

OMEN TV--Two-Way Programs for Physicians

Beginning in 1966 and continuing through April of 1975, the Center for Continuing Medical Education in cooperation with the OSU Medical Audio Visual and Television Center, conducted two-way continuing education television programs for physicians in central and southern Ohio, as well as western West Virginia.

In recent years, this involved the transmission of two different one-hour programs which were broadcast on successive Wednesdays in April at the noon hour on five public television stations (including WOSU-TV in Columbus) and numerous cable TV systems. The programs reached out to as many as 1,000 participants at twenty-two hospitals in one season.

Each program featured two, fifteen minute, pretaped, instructional modules. Following each module, participating medical staffs called in their questions on the telephone and directed their queries to the faculty members who prepared the modules.

The programs were well received and met a need. However, due to television scheduling problems and a "time" conflict with the Public Broadcasting System's popular "Sesame Street" at the noon hour, the two-way TV programs for physicians have been temporarily discontinued.

The TV modules produced during the ten year history of this series were of high quality as evidenced by the fact that over the years, many of them were obtained by the National Center for Continuing Medical Education in New York City for distribution to its member hospitals throughout the country.

ONCE (Ohio Nurses Continuing Education)--Two-Way Audio Programs for Nurses

In 1966, the Center in cooperation with the OSU School of Nursing, conducted four pilot programs in two-way nursing continuing education. Originating in the studios of WOSU-FM in Columbus, the nursing network (operating under the acronym "ONCE") began by transmitting to twelve hospitals via two FM radio stations. Two thousand signed registrants were recorded during the first year.

By 1972, the number of participating hospitals grew to sixty-one. When the series concluded in 1973, a total registered attendance of nearly 56,000 had been reached in its seven years of existence.

Like the OMEN audio programs for physicians (which will be described in detail later) the nursing programs lasted one hour. The first half of each program involved a didactic slide presentation with the audio transmitted between 2 P.M. and 3 P.M. by commercial and non-commercial radio stations. The second half of each program consisted of a two-way discussion period. In the earlier years of ONCE, the questions from the hospitals were transmitted to Columbus by Class D broadcast lines attached to microphones at participating hospitals. In later years, telephones were used to transmit the questions.

The perennial problem in developing and sustaining the network was the dual difficulty of: (1) finding radio stations willing to carry the programs on a regular basis on a particular day of the week, and (2) finding interested hospitals who could clearly receive the signal of the radio stations and who were willing to participate on the specified day of the week (Monday, Tuesday, or Friday).

At one time, the network had thirteen radio stations participating. But, by the 1972-1973 season, only seven stations were providing service to thirty-eight hospitals. Consequently, the School of Nursing determined that its faculty time could best be spent in other endeavors and the network was dissolved.

OPEN (Ohio Pharmaceutical Education Network)--Two-Way Audio Programs for Pharmacists

Two-way audio programs for pharmacists were initiated in 1971 by CCME in cooperation with the Council of Ohio Colleges of Pharmacy (an organization composed of the four colleges of Pharmacy in Ohio). In 1971, four one-hour, accredited programs were aired on two FM radio stations and presented at thirteen hospital listening centers. Broadcast on Wednesday evenings from 8 P.M. to 9 P.M., a different program was aired each month, from January through April.

To date, paid registered attendance in the OPEN broadcasts reached their peak with the 1974 series, when over 1,500 pharmacists registered for them. In 1974, twelve different one-hour programs were aired on thirteen commercial and non-commercial radio stations and presented at thirty hospital listening centers.

During the recently concluded 1975-1976 season, twelve different ninety-minute programs were produced. They were aired on Thursday from 10 P.M. to 11:30 P.M. on nine FM radio stations and heard at twenty-one hospital listening centers. The first four programs were aired weekly from late October to late November. The next four were aired weekly in the month of January, while the last four were presented in March.

Except for WOSU-FM in Columbus, all the radio stations and many of the listening centers were fed the programs by QKT coupler phones situated at the Center for Continuing Medical Education.

Registrants in the OPEN broadcasts receive extensive printed materials. Between thirty and forty-five minutes of each ninety-minute program is devoted to a question and answer session.

While the OPEN series is continuing to render an important service to pharmacists in Ohio and nearby areas of West Virginia, registered paid attendance is down somewhat. It is theorized that this is partially due to the proliferation of accredited continuing education programs for pharmacists that have been approved in recent years.

Also, there is an increasing resistance from FM stations to provide the air-time for the programs. A number of the stations have pre-empted some of the March programs because of schedule conflicts with local high school basketball teams in the state tournaments.

OMEN--Two-Way Audio Programs for Physicians

The 1975-1976 season of the OMEN (Ohio Medical Education Network) two-way audio programs was the most successful in the fourteen year history of the network. Medical staffs at seventy-three hospitals in seven states and Canada participated in the programs. At the end of the 1975-1976 season, the total registered attendances in the fourteen years of existence of the network are expected to exceed 180,000 when the final calculations are computed.

OMEN began in 1962 as a modest network with two FM stations providing service to twelve central Ohio hospitals. In its first year, the network provided thirteen, hour-long, once-a-week programs each Wednesday at noon via WOSU-FM in Columbus and WHIO-FM in Dayton. As is the case today, the first half of each program consisted of a lecture/slide presentation with the last half devoted to a question and answer period. At that time, microphones were situated at each participating hospital and they were attached to Class D broadcast lines going from the hospital to Columbus, thus permitting excellent fidelity in the transmission of the questions. Today, regular telephones are used to transmit the questions.

OMEN grew quickly in its early years. Within three years (by 1965), the network was providing Monday through Friday programming for a twenty-one week season to fifty-three hospitals via fourteen FM radio stations. By 1971, the season was increased to twenty-two weeks with sixty-eight hospitals taking part.

Hospital participation waned a bit in the 1973-1974 season when the number of participating medical staffs dropped to fifty-eight. Further, by that time, it was becoming increasingly difficult to obtain FM radio time at the noon hour on the days which hospitals wished to participate. As a result, it became increasingly necessary to provide direct telephone feeds to the hospitals when it was impossible to find an FM station in their area which could provide them with a reliable audio signal of the programs. Consequently, in the summer of 1974, a decision was made to make the programs totally closed-circuit and eliminate the use of radio stations. Thus, with the 1974-1975 season, we began to make exclusive use of the two-way telephone system which is employed today, with each hospital receiving its own direct telephone feed from OMEN via QKT coupler telephones.

The Broadcast Constraints of Clock and Calendar No Longer Prevail

By shifting the OMEN transmission system from FM radio stations to QKT telephones, the broadcast constraints of clock and calendar no longer prevail. When hospital interest warrants it, the programs can last well beyond fifty-nine minutes and thirty seconds. Often, now, the two-way discussion periods conclude several minutes "late" and, on occasion, fifteen to twenty minutes "late."

Where previously, the fear of pre-emptions by radio baseball games limited the length of the OMEN season to twenty-two weeks, now, the length of the season can be determined by membership interest. The 1975-1976 season was expanded to twenty-five weeks and based on membership response to our annual questionnaire, the forthcoming 1976-1977 season will provide twenty-eight weeks of programming. Between the weeks of September 27, 1976 and April 25, 1977, OMEN will present 140 different two-way programs at the noon hour, on a Monday through Friday basis. (As usual, no programs will be presented Thanksgiving week, Christmas week, and New Year's week.)

Another effect of the shift to closed-circuit telephone transmission has been a dramatic improvement in the quantity and quality of the comments made during the two-way discussion periods in the programs. With professional privacy insured, medical staffs were much more open in discussing specific patient cases. The result was programs of greater benefit to all.

Format of the Programs

As mentioned previously, the OMEN programs are *transmitted* each weekday (Monday through Friday) with a different topic being covered each week. However, participating hospitals *receive* the programs once-a-week on their pre-selected day of participation. (Some hospitals take part on Monday, others on Tuesday, others on Wednesday, Thursday, or Friday.)

The first twenty-eight minutes of each program is devoted to a slide/lecture presentation by at least two physician-panelists, usually with disparate and complementing specialities. Panelists are drawn from the medical faculties of The Ohio State University, the University of Cincinnati, the Case Western Reserve University in Cleveland, and the Medical College of Ohio at Toledo.

As each speaker presents his talk, he calls for appropriate slides to be projected in the conference room of each hospital. (Two by two color slides have been numbered and sent to each hospital by the United Parcel Service in advance of each program. The presentations have been "pre-taped" to assure lecture quality and to eliminate the need for the panelists to present the same lecture each day for five consecutive days.)

At the end of the lecture/slide presentation, the program is opened for a "live" two-way discussion. Using a confidential Columbus phone number that has been supplied to them solely for their use on their day of participation, member hospitals dial in their questions and comments. When they call, a light appears on the telephone call director in the OMEN control room. The light indicates which hospitals are calling in. The program moderator serves as a "traffic officer" and calls on each hospital for its comments.

The number of hospitals that may participate in the OMEN programs on any one day is limited. (During this past season, no more than fifteen medical staffs took part each day in the two-way dialogues.) The small seminar approach is used to insure that ample opportunities exist for physicians at all hospitals to actively participate in the discussions and "zero in" on their own particular interests and needs. The closed-circuit nature of the network frequently fosters lively listening for all physicians in the audience.

Supplementary Materials and Services

About ten days before each program, OMEN mails a "program package" to each hospital. In this package is a set of numbered two-by-two color slides, usually between twenty and thirty different slides. Each slide is numbered on the film and on the outside edge. During the lecture portion of the program, the physicians call for the slides by the numbers: "slide one please," "slide two please," etc. This numbering insures that each hospital is showing the proper slide at the proper time.

The program package also includes a supply of program outlines with journal references. (These outlines are usually two or three pages in length.) Enough outlines are sent so that one can be distributed to each physician in attendance.

In addition, an attendance sheet is sent, as well as a number of posters which may be put up in the hospital to publicize the programs. Audio cassette copies of the lectures are sent to those hospitals ordering them. More than half of the hospitals do order a cassette and they keep it, together with the slides, in the hospital's medical library.

In advance of the season, each hospital is sent an OMEN notebook so that they may keep their program outlines in the hospital's library for ready reference. An attractive brochure, listing the names of the participating hospitals plus the topics and panelists for the forthcoming season is mailed to each medical staff member in all OMEN hospitals just prior to the beginning of the season.

OMEN's Telephone "Delivery System"

Insofar as we are presently aware, OMEN's telephone "delivery system" is somewhat unique among currently existing telephone networks. Consequently, it should prove useful to explain how our system functions.

To participate in OMEN, each hospital needs two telephones. One telephone (a "regular" phone) is used to call in questions and comments during the programs. The second telephone (a QKT coupler phone) is used to receive the programs and is hooked-up to the network-specified amplifier and loudspeaker at the hospital. New members buy the amplification equipment through OMEN and it becomes their property. This assures the hospital of outstanding sound quality in program reception. Also, in terms of economics, our calculation is (on the basis of comparative estimates from the Ohio Bell Telephone Company in Columbus) that over a four year period, this method is less costly to the hospital than the alternative of having the hospital pay for the installation and monthly service charges of a portable conference telephone.

Member hospitals pay all costs associated with their telephones, including long distance telephone charges. OMEN provides hospitals with a detailed Procedure Manual to help them with the installation and operation of their equipment.

QKT coupler telephones are commonly used today by radio stations to get their play-by-play sports broadcasts back to their stations from distant cities. As used in the OMEN programs, the utilization of a coupler phone permits the receiving hospital to pull up a simple plunger, located in the phone's cradle, and thereby allow the hospital to bring the audio material that OMEN is feeding into the hospital's amplifier and loudspeaker. (The QKT coupler phone is connected by a cord to the amplification equipment.) The coupler phone also has a mechanism which disconnects the mouthpiece of the telephone, so that un-wanted feedback does not result at the receiving hospital.

At the OMEN control room, we also have QKT coupler phones. There are fifteen of them . . . i.e., enough to handle the maximum number of hospitals currently participating in a program on any given day. The OMEN program feed goes from our studio into two multi-channel line drivers, we can individually adjust the volume level of the program for each hospital participating in the network on any day. When the plungers on our coupler phones are pulled up, we bring the OMEN program into our telephones thus allowing it to be transmitted to the participating hospital.

A few minutes prior to the beginning of each OMEN program, participating hospital call the confidential number of their pre-selected coupler phone in Columbus. Thus, through the use of coupler phones, in Columbus and at the participating hospital, OMEN members can make the connection that results in their reception of the OMEN programs.

Who Belongs to OMEN?

What are the characteristics of the hospitals belonging to the network? The answer seems to be a diverse group of loyal hospitals. Forty-eight of the seventy-three hospitals taking part in OMEN during 1975-1976 first joined the network five or more years ago, with thirty-one of those hospitals boasting memberships that go back ten or more years.

In terms of hospital bed size, the network is almost equally divided between hospitals with less than 200 beds and those with 200 or more beds. Thirty-eight are in the former category, with thirty-five in the latter. OMEN's largest member hospital is the Veteran's Administration Hospital in Chillicothe, Ohio with 1,285 beds. Among its smallest hospitals is The Kettering Hospital in Loudonville, Ohio with 32 beds. The network's smallest out-of-state hospital is a 68 bed facility in Clarion, Pennsylvania, while its largest is the 540 bed Methodist Medical Center of Illinois in Peoria. OMEN member hospitals are found in rural areas, as well as various sized cities. The network's service reaches into Chicago, Illinois plus Ohio's six most populous metropolitan areas--Cleveland, Cincinnati, Columbus, Dayton, Toledo and Akron.

Geographically, fifty-six of OMEN's member hospitals are in Ohio with seventeen others located in Illinois, Pennsylvania, West Virginia, Indiana, Kentucky, Michigan, and the province of Ontario. OMEN's most distant medical facility is found 405 airline miles from Columbus at Sacred Heart General Hospital in Chester, Pennsylvania.

At this juncture, at least, it appears that the network's shift to the use of telephones (rather than radio stations) to transmit the OMEN programs was a wise one. Certainly, it has offered a number of advantages.

THE EDUCATIONAL TELEPHONE SYSTEM IN MISSOURI: A CASE STUDY

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Everyone is familiar with the worldwide telephone network which permits communication with people located anywhere in the world. The University of Missouri Educational Telephone Service is a specialized adaptation of this worldwide telephone network which goes beyond the ordinary telephone use.

Amplified telephone, one function of the Educational Telephone Service, makes it possible for more than one person to listen to a presentation by directing the sound from the telephone earpiece into a loudspeaker. Each Extension Area of Missouri is equipped with amplified telephone receiving equipment.

The heart of the Educational Telephone System is a conference bridge located in Whitten Hall on the Columbia Campus of the University of Missouri. The bridge permits the interconnection of 22 telephone lines.

The University of Missouri conference bridge automatically adjusts—by boosting or reducing—the levels of the incoming telephone signals so that all lines are kept at the same volume level.

The potential educational and administrative applications of the ETS are extensive. In its broadest concept, it is a communication network capable of using sources of information anywhere in the world. A lecturer can talk to and be questioned by people located in various Extension Centers around the state. Other uses could include administrative conferences.

The Educational Telephone System is an economical and effective means of bringing people together for an exchange of ideas and information. The user of the system pays only the line charges for his program plus the charges for any special installations. The UMC Extension Division pays the maintenance and administrative costs of the system. Line charges vary with the number of lines used and the distances involved. Charges within Missouri average about $14.00 per line hour of daytime use and $12.00 per line hour in the evenings.

An effective example of the ETS in action is being conducted quarterly in Missouri by the Extension Faculty of the Department of Agricultural Economics. The program is entitled: Agricultural Economics Outlook Conference. The program utilizes both the ETS and the SCA-FM Radio Network of Missouri. Those areas which receive an adequate radio signal receive the program that way. Other areas receive the program by the Amplified Telephone. All areas gained feedback potential through the Educational Telephone System.

Four to five Agricultural Economists take a look at the current economic situation in the United States with regard to special areas such as: livestock, dairy, poultry, and grain.

Following an hour of general discussion, farmers in participating areas are asked to respond and to address specific questions. Five or six areas are interconnected by the ETS per evening. Specialists conduct the program on four consecutive nights to cover the entire state.

Glenn Grimes, Extension Livestock Marketing Specialist explains how the program began. "We really started using the amplified telephone as a method of delivery to get to our area staff back in 1973 when we were having, I guess for the first time, at least in my experience, markets that were substantially more erratic than usual. So, we thought that it was kind of important, when we were having the influence of the ceiling prices that had been imposed on livestock, to try to get to our staff quick, so we did schedule a meeting with all of our staff over the entire state using amplified telephone. Now, I'll very quickly admit I was somewhat of a skeptic and thought that this kind of a delivery system probably fit only with emergency type kind of programs that you might have, but the response from our staff was so good following this initial experience that we scheduled a couple more, and, behold, the surprises continued to occur and we did get a right good reception.

"Now, what we did do was leave it up to our area staff as to the people that they would invite, and many of them at least followed this kind of a procedure: That was that they would invite the Ag. leaders and special people that they thought would like to attend. And they did this on a personal basis, usually either face to face or by telephone. But a number of others did see an opportunity, and they just started opening the meeting to the public and inviting whoever wished to attend. For the past two years what we have done with the amp. telephone, and also we have tied in the SCA-FM radio, and for this last couple of years we've held these meetings every three months. Now, what we do is, we do have 20 some locations we go to over the state by amp. phone. We do this in 4 nights. We follow a kind of a format as far as the program is concerned of one hour discussion. Our heavy emphasis, of course, here in Missouri, is on livestock and grains, both feed grains and food grains, but we do have one area of the state that we do have our dairy specialist on, and at times we will have our poultry specialist, and occasionally we've thrown in an extra bit where we've had our staff member that works in the area of consumer information discuss what the prices we were talking about live might have an impact on as far as the food prices are concerned."

Glenn critically evaluates the effort..... "The last one of these that we held, which would have been our December meetings, we had attending at the 20 some hook-ups that we had by telephone, we had an average attendance of 25 people at each one of those hook-ups. We've had 17 places that we know of where people were listening by the SCA-FM radio and we had an average attendance at those of 12. So, I'll tell you, for a person that was a disbeliever, and one that travels some 2500 miles a year by automobile and substantially more in the air, I found this a very easy way to travel the state of Missouri in four nights. And we think that if we work hard enough at it and study our lessons hard enough, that this is a system that is going to be of considerable value to us in the future."

Area Farm Management Specialists were polled regarding their evaluations of the program. Roger McCoy, Farm Management Specialist in Albany, summarizes the views of the group.

"The market outlook programs are being well received up here in our area. The farmers, even though they know that the outlook might change, with the factors that affect the markets, when it changes, still they're quite happy to come in and be able to hear what the state marketing specialists have got to say, as for grain and livestock. Quality has been coming out real well, and one thing I think the farmers have liked very much is that the programs are being held in a real easy, relaxed sort of manner. It's almost as if Glenn Grimes and John Ragsdale are sitting right there in the room with us and it's really handled easily on a conversational type level. We in the field are receiving visuals which we put on the overhead to illustrate the figures that are being given by Glenn and John. One of the things I've really liked about it has been the second part of our program where the farmers sitting in our meeting room have a chance to ask the marketing specialists questions - their own questions. And, of course, usually each night there's about four of us on around different parts of the state, and we're able to hear the questions and answers going out to these other parts, the other locations as well as our own. And this really makes it more of a relaxed, and as I said earlier, the kind of conversational close type meeting that farmers are really enjoying out here. And our numbers are growing all the time to this meeting."

An average of 150 farmers participate in the Amp. Phone Program per night, or 600 per conference. Meetings are held four times a year. An extensive evaluation of the effectiveness of the conference was conducted in 1975.

Results clearly support the belief that the Educational Telephone System is an effective teaching technique and delivery system for University Extension Programs.

> 90% of the farmers responding reported that the meetings were informative and provided them a unique opportunity to discuss central economic issues with several specialists.
>
> Only 10% reported disappointment in the system preferring an on-sight presentation.
>
> All respondents indicated appreciation for the opportunity to ask the specialists specific questions over the phone.
>
> 65% of the respondents suggested a greater use of visuals during presentations.

Glenn Grimes reports that future Outlook Conferences will continue to be presented over the SCA-FM Radio Network and the Educational Telephone System. Especially in an era of tighter money, consideration must be given to the cost analysis of the ETS. Four Extension Specialists can cover the entire state with current information in 3 or 4 nights at very little cost to the university and with acceptable effectiveness.

The Educational Telephone System in Missouri is presently meeting the need of providing an inexpensive delivery system for University Extension Specialists. The potential of the system seems exhaustive.

THE TECHNOLOGICAL SIDE OF TEACHING BY TELEPHONE

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The Open University has, from its outset in 1969, utilized a wide range of communication channels to reach its widely scattered student population. Correspondence texts, television, radio and mailed tapes are all regularly in use. Recently the University has made attempts to add yet another medium, the telephone, to its teaching system. It is about three years since experiments began in this area and teaching by telephone is now becoming a familiar part of many undergraduate courses. There are, of course, difficulties in using the telephone in this way and broadly speaking they can be split into two halves, although the boundary does become a little fuzzy at times. The two areas are those involving psychological problems and those involving technical problems. In this paper I shall restrict myself to a discussion of the technical problems, but as you will see, these often relate to the human interface with the equipment and therefore lie quite close to the fuzzy boundary I mentioned earlier.

One of the first problems that needs to be tackled is the unsuitability of a conventional handset telephone in a teaching environment. As its name implies this device requires hand support and therefore does not leave both hands free for other tasks. Two main solutions to this problem have been suggested. One is the use of headsets, consisting of an earpiece and boom microphone supported by the head, linked in a teleconference situation, but perhaps the most promising developments have been those in loudspeaking telephones. These devices replace the earpiece and microphone of the handset with a loudspeaker-microphone combination which can operate at some distance from the user or even a group of users. As many experimenters have discovered, to their dismay, the vast majority of loudspeaking telephones presently available are far from ideal in their performance. At this point, however, I must spring to the defence of the engineers who are working in this area. The design of loudspeaking telephones is tremendously complex particularly if the user is to remain unaware of certain technical problems. The ideal loudspeaking telephone should be transparent to the users at both ends; that is, the speech channel should be available in both directions at all times as it is on a normal telephone link, or indeed if speaking to someone in the same room. This is the specification which is very difficult for the engineer to meet. If the channel is totally bidirectional, the two rooms, one at either end, complete a "circuit" and under certain conditions the loop formed can become unstable. People experiencing this phenomenon usually put it down to some fault in the rather complicated looking electronic bits and pieces, but on further examination they find that it is the room that is behaving in a highly complex manner. If you were to plot the frequency response of a room you would find that it is highly irregular, full of peaks and troughs some 30 decibels apart. The sound level perceived by a human listener in such a room would be an average level, somewhere between the peaks and the troughs. The electronic amplifiers on the other hand may go unstable if a single peak exceeds a critical level. One solution is therefore to modify the response of the room so that the average level is much closer to the peak which would cause instability, in doing this the listener would perceive louder speech but the system would remain stable. The easiest way to move the average in this way is to 'flatten out' the irregular response of the room. Most users of loudspeaking telephones have discovered that they work better in a heavily curtained, carpeted room rather than one with bare concrete for the walls and floor. This is an example of flattening out irregularities by adding acoustically dead material to a room. Another, but at the moment much more expensive technique, is to electronically level the room's frequency response. This may indeed be the answer to loudspeaking telephone design in ten years time, but at the moment, due to the extremely complex characteristics of even a simple empty room, the cost is prohibitive.

The type of design I have been discussing so far is one where the speech channel is open in both directions at all times. In practice this design has not been welcomed by the companies which operate telephone networks, since it is not unconditionally stable. An unstable device can be a real problem on a telephone network since it can interfere with the signalling between telephone exchanges and also cause a nuisance to other network users by producing audible tones on other channels. A more favoured type of design from the network operator's point of view, is the voice switched loudspeaking telephone. With this type of design the loop which causes instability is actually broken by allowing the speech channel to operate in only one direction at a time, the direction being controlled by measuring voice levels. In this way stability is guaranteed, but the network operator's pleasure is offset by user difficulties experienced with this type of design. Speech is very much a two-way method of communication and it is surprising to measure just how often both directions are in use at once. You often interrupt for instance to tell someone that they have missed a point or that they are talking rubbish. With most designs of loudspeaking telephones such interruptions are not possible since the channel will only be open from talker to listener. There are many other problems associated with the use of voice switched loudspeaking telephones, they are troublesome if background noise level is high, they tend to cut out initial syllables and portions of conversation where the talker mumbles or lowers his voice, but at the moment they represent the vast majority of terminals available for use on the public telephone network.

The loudspeaking telephone provides a means of enabling two groups of people to communicate and leaves their hands free to take notes or turn pages in books. In certain situations, however, it is necessary to expand the number of locations involved in the conversation above the two that a normal telephone call provides. This expansion is known as teleconferencing. In a conference call a number of locations are linked together in such a way that each location is aware of all the others as if they were at the other end of a simple telephone line. To enable this to be done effectively, equipment known as a conference bridge, or conference amplifier, must be used. This is normally installed in the telephone exchange which establishes the conference call, but in some locations users have installed such equipment to enable them to set up their own teleconferences. Amplification is required if the system is to perform adequately over any appreciable distance. The reason for this is that in the absence of an amplifier the power output from one terminal would be shared out to so many receivers that each would receive insufficient power to operate satisfactorily. The conference amplifier makes up for this deficiency ensuring adequate listening levels at each location on the conference call.

A conference amplifier has many inputs and many outputs. One of the design problems is to ensure that in operation the amplifier is not able to feed back signals from one of its outputs to an input thus causing similar stability problems to those encountered with the loudspeaking telephone. The other design problem is to enable such amplifiers to cope with lines of variable quality and still produce acceptable listening levels at each location.

Perhaps the main criticism levelled at teaching by telephone is the lack of a visual link. To provide such a link by means of television is not possible over the telephone network since a broadcast quality television picture requires the same complexity of transmission link as about 2000 telephone calls. Television links are, however, available between a few studios in the United Kingdom but the cost of using this sytem, the Confravision System, is high, currently £180 per hour. Fortunately it is possible to provide a limited visual link over a normal telephone line.

There are three methods in use for achieving this. The first is slow scan television. Normal broadcast television consists of transmitting a number of still images at a high rate. These are perceived by the viewer as a moving picture. Because the number of pictures per second is high, normal television signals cannot be transmitted over a telephone line. As I have said it requires the equivalent of about 2000 telephone circuits to transmit a television signal. If, however, the requirement for moving pictures does not exist it is possible to transmit television pictures over a telephone line by drastically reducing the rate at which individual "frames" are transmitted. This slow scan technique can transmit a complete picture in around 2 minutes. It is, however, expensive to install, but where the need for transmission of half tone pictures for class viewing exists it provides a practical solution.

The second method in use is known as facsimile transmission. This technique has been used for decades to "wire" photographs around the world for newspaper use. It involves scanning the original document or photograph in a series of lines and transmitting information about dark and light areas to the far end where a similar scanning arrangement produces a duplicate of the original. Its a bit like a slow photocopier where the copy appears at the far end of the telephone channel. Recently low-cost facsimile systems have been developed which enable transmission of black and white pictures only, as opposed to the much more expensive photograph transmission system which must be capable of producing a wide range of half tones. These devices are known as document facsimile systems. In contrast to the photographic facsimile systems they normally produce copies without any chemical processing.

Both of the systems just discussed, i.e. slow scan television and facsimile are used to transmit a complete original to a distant location. In teaching it is often more useful to be able to build up diagrams as an explanation proceeds thus leading the student rather than presenting him with a complex diagram in its entirity at the outset of the discussion. The third class of visual systems, commonly referred to as remote writing systems, permit just this approach. The early embodiments of such systems involved the use of a pen forming part of a mechanical linkage at the transmitter. The position of the pen is converted via the linkage, some electrical transducers and signal conversion to a form suitable for transmission over the telephone line. At the receiver motors drive a similar linkage attached to another pen, the motor movements being controlled by the signals from the line. The remote pen thus mimics the movements of the originating pen thus producing a duplicate drawing at the receiver. A further development of this system enables the remote pen to produce its drawings on a transparent film which can then be projected for class viewing. When a drawing is finished with, the originator can move to a clean piece of film by a specific pen movement at the transmitter. He can then begin building up a new drawing. This technique has been used for teaching by telephone for many years and appears to be quite satisfactory. It is, however, in the next few years likely to be superseded by systems which exploit the vast range of low-cost electronic devices which are rapidly becoming available. The cost of producing complex mechanical linkages together with their relatively low reliability when compared with electronic components, have led designers to try to eliminate such assemblies from remote writing terminals. Several research groups including one at the Open University are concerned with using a television receiver as the remote display device. In this application the television set provides a low-cost display with no moving parts. The cost of the electronic components required to convert a receiver to act as a display is continually falling and without doubt this form of display, already competitive, will form the basis of the majority of remote writing systems for class uses. Similar developments have taken place at the transmitting end of the link. Systems are now available which enable the position of a pen on a writing surface to be measured electronically. This not only improves the reliability of the system and potentially reduces its cost but also assists the user since he now does not have to cope with a rather unnatural mechanically linked pen. The pen is usually much more loosely connected to the terminal by a length of thin flexible wire which is almost unnoticeable in use. Indeed some designs have been produced which enable a perfectly normal ball point pen to be used. They do, however, normally involve the use of a rather spongy writing surface.

The system under development at the Open University employs a writing technique which enables the user to use a normal writing pad up to half an inch thick, placed on a special supporting surface. An electrical field pattern is set up above the surface, and the pen picks up a unique pattern dependent on its position. This position is then decoded, using a microcomputer, to produce actual co-ordinates on the pad. Further processing then takes place to eliminate some of the redundancy in drawn sketches, followed by a smoothing out of jagged lines caused by small hand movements. The coordinates are then transmitted via a data link to the receiver where they are stored in a memory and subsequently displayed on a television screen. This means that students can continue to view the image after the data link has been broken, an important factor if the same telephone line is used alternately for voice and data. At the moment the Open University device is being produced in limited quantities for field trials on the private network of the University. Hopefully, when permission from the Post Office is obtained, it will be introduced into wider usage on the public network.

GAME-PLANS AND REWARD STRUCTURES FOR TELECONFERENCING

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Introduction

Educational teleconferencing [1] may be viewed as constituting an ' n-person positive-sum ' game[2] in which the very long term pay-off is mutual cultural nourishment, the mid-term pay-off is enhanced individual potency(= wisdom + motivation + status), while the immediate stakes and pay-offs are in the form of people's 'attention-time' accorded or captured.

In general,an n-person game has many solutions. There are many strategies and many ways of forming coalitions which will ensure favourable 'imputations' (pay-offs) to players in some of the coalitions. Coalitions may'dominate' in many ways. However a large proportion of these will be socially divisive and otherwise destructive, so that it is customary to establish norms and rules of behaviour which tend to exclude asocial play. The traditional conduct of classroom education involves many such norms and rules which have grown up over time. These traditional norms and rules exclude not only destructive imputations but also a number of 'heretical'[3] strategies which may be very worthwhile.

When knowledge-development is moved out from the classroom through teleconferencing there is even more likelihood that traditional scenarios and customs,if persisted in,will unnecessarily reduce the effectiveness and fruitfulness of teleconferencing.

Indeed, one of the norms established to protect the knowledge development game in higher education takes the form of a tacit agreement not to discuss the game-plans and reward structures which actually allocate attention-time and other resources to students. Instead when teaching isdiscussed it is customary to focus the discussion on choice of subject-matter topics, or on the kinds of problem assignments students should carry out. The current vogue for the evaluation of teachers, and occasionally even for the evaluation of courses, breaks this taboo to some extent. But most of the evaluation procedures[4] still take the traditionally institutionalized game-plans and reward structures quite for granted.

It is posited that an optimal game-structure maximises the long term pay-offs summed over all the participants, while providing re-direction or possibly a supportive floor for those unable to develop in the direction of the programme or specialisation area of the particular educational game.

The problem to be discussed here is: how to design such optimal games,given that they will be played using the telephone as the basic means of communication,and of control -in the cybernetic sense.[5]

Perhaps at this point it should be clearly stated that this paper is not concerned with instructional games in the usual sense [6] which are completely pre-designed to achieve specific instructional objectives. Rather,what is under consideration here is the underlying resource allocation activity which cuts right across the traditional divisions of instruction, management ,and curriculum.

Performance Monitoring

Educational teleconferencing is a group activity where the members of the group are physically dispersed but otherwise are in direct contact through voice, and or alpha-numeric[7] graphic telecommunications. Richard Hesslin and Dexter Dunphy [8] collected detailed abstracts of 450 small-group studies, and concluded from an analysis of these, that three variables account for most of the variance in member satisfaction. these satisfaction-determining variables are:

1) Status consensus.
2) Perception of progress toward group goals.
3) Perceived freedom to participate.

Clearly these three considerations are of paramount importance in the design of game-plans for teleconferencing. In a sense the third criterion is the critical one since if people are free to participate they can carry on exchanges and discussions in order to establish group goals and consensus about the status to be accorded to various task specialists and other participants.

The time periods during which a given participant is actually speaking, or otherwise inputting a message or transmission into the teleconference is an easily measured variable However,if no-one pays attention to the input , it is at best an illusory source of satisfaction to the participant, so that 'input-time' is not really a good measure of participation. Real participation implies that someone else pays attention, and in some way utilises the input. Consequently the'attention-time' accorded by other participants is a more suitable variable to measure,to monitor performance.

'Attention-time'of itself is not enough. (consider the devastatingly debasing effect that viewer ratings have had in shaping television broadcasting) For attention to be valuable it must result in change or choice , and preferably changes of enduring nature or choices of extensive effect. If I teach Ohm's law to a student ,hopefully he or she will go on using it for many years to come. Better still if I teach Ohm's law to a teacher, hopefully the teacher will go on to teach it to many other people in turn. Hence attention -time should be weighted by two further variables:

1) an estimate by the attendee of how long the information received will be actively retained. and-
2) an estimate of the further audience which is in turn commanded by the attendee of this particular transmission. Elsewhere[9] I have referred to this as the 'relevant credibility status' of the attendee. Relevant in the sense that the audience commanded by a nursery school teacher would not be'relevant'if she were attending to my lecture on Ohm's law.

Weighted attention-time is a variable which can be measured with some confidence when communications are conducted using the telephone , and some recording device , and on,or off-line computers. Further if the knowledge development activity is conducted on the same system over protracted time periods, the validity of attendees'estimates of the time over which they will retain and use information, and the number of further people they estimate they will transmit it to can be checked against citations and audience tabulations. It is such validated referred audience estimates which are the basis for computing 'credibility-status'. It is noteworthy that while attention-time and credibility-status are valid measures of performance for teleconferencing in general, they do not form a complete set, and must be complemented with other measures of effectiveness and efficiency related to the specific task goals of particular groups.

In order to get estimates of expected active retention and of probable secondary audience size it is necessary for the transmissions to be broken up into chunks to which the estimates refer. In verbal teleconferencing a 'chunk' will sometimes be a single interjected sentence, at other times it will be a number of sentences with other people's utterances interspersed. It is probably best to leave it up to each auditor (attendee) to demarcate the chunks which he records ratings for. With computer-based teleconferencing the transmissions may be chunked un-ambiguously by the contributor, and those who retrieve the chunks may be automatically queried and timed, in order to record the retention and audience fan-out weighted attention time accorded each chunk.

Small chunks have the disadvantage that a disproportionate amount of attendees' time is taken up attempting to estimate how long they will retain the information from each chunk. Very large chunks have the dis-advantage that they may contain a few prized and memorable points mixed with much noise. Ideally the contributor should get feedback which lets him know which of his points, conjectures, refutations etc. were highly valued and which were ignored. The specific electronic components available in the teleconferencing system should be chosen, if possible, to facilitate the provision of feedback regarding chunks of a few hundred words. (plus symbols graphs etc.)

For instance this could be considered the end of the second chunk in this paper. (The first being the Introduction) And I could now ask you approximately how long you expect you will actively remember some of this chunk ?-a day a month a year - longer? -----
And: How many other people are you likely to mention it to: 1, 3, 12, more? For each of these questions it is also desireable to ask for your degree of certainty on a zero to one scale. (-an overlay card for the keys of a touch-tone phone, or a response indicator kludge with four slide potentiometers, would facilitate registering these appraisals.)

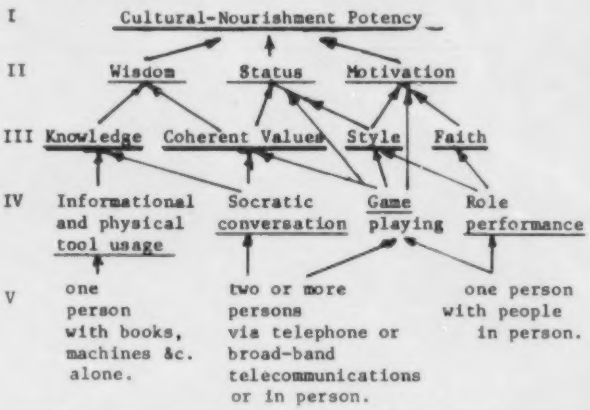
A 'memorableness' rating rather than a more general 'value' rating is requested, because it is more concrete and specific (Charles Osgoodes Semantic differential studies show that there are a number of sub-clusters of 'the valuable' which are confounded if a single value scale is used) and because educational teleconferencing hopefully results in learning which will be retained by the students.

Media, Activity. Goal Relationships

There are some things a learner can do perfectly well entirely alone, such as: read books or carry out experiments, or solve puzzles, problems etc. (Here and throughout I am writing of normal adolescents and adults) In general, one can work with conceptual and physical tools on ones own, at least to a point. If programmed texts, computer-assisted instruction, and information retrieval systems are included among the tools the auto-didact can go very far indeed in the development of knowledge and skills.

There are other activities such as carrying on a conversation, playing a 2 or 'n' person game, or performing a role, or participating in a liturgy, which are impossible without direct involvement with other people. Sometimes telephone, electrowriter, and video communications can support some of these activites.

Figure 1. Diagram of relationships between two levels of goals : I Societal, and II Personal, and the instrumental personal capabilities III which support the goals, and the learning activities IV which foster the capabilities, and the comunications media V necessary to the activities.


I
Cultural-Nourishment Potency
II
Wisdom
Status
Motivation
III
Knowledge
Coherent Values
Style
Faith
IV
Informational and physical tool usage
Socratic conversation
Game playing
Role performance
V
one person with books, machines &c. alone.
two or more persons via telephone or broad-band telecommunications or in person.
one person with people in person.

Basic Hypothesis

The most successful procedures for knowledge development are those of scientific research. To be more specific these involve:/the careful selection and formation of teams of people with complementary skills and knowledge/ the thorough exploration of what other people have already tried to do in a problem area/ the envisioning and statement of plausible conjectures with large implications, or at least testable ones./ the employment of theoretical and empirical procedures to attempt to refute the conjectures / publication in refereed journals with citations of all previous work which was directly employed / the according of high status to contributors of timely and powerful conjectures, and also to those who contribute skillful refutations of highly plausible conjectures/ the closing of the loop; by allocating increased funds and other resources to those groups which have earned high status.[10] There certainly are weaknesses in this approach, particularly if granting activity becomes concentrated in a few agencies and dominated by a few people, but on the whole it is a very productive and nourishing way of extending people's capabilities.

The basic hypothesis of this paper is that game-plans and reward-structures for educational teleconferencing should be based on the opportunity-allocating credibility-status game of professional science, rather than on the management/curriculum/instruction/model employed in the public schools.

To put it another way, my hypothesis is that it is likely to be more mutually nourishing and less socially destructive, to openly acknowledge that the real cultural dvelopment games are ones in which both individuals and groups of people compete to put forward timely and powerful transmissions which will be attended-to and used for some time to come, and which will enhance the status of the competitors and their further opportunities, and to use this game as the basis for further educational developments, than to fixate on knowledge and skill 'objectives' and universal competancy, as the bases for educational teleconferencing system designs. The corollary to this is that people must be counseled and encouraged to join another coalition, or choose another game altogether, if they are not succeeding in improving their credibility-status in the 'game' they are in.

Game Plan Design

Formal game theory , particularly n-person game theory is not really oriented toward the design of games. The focus there is on the pay-off matrix; the internal workings are scarcely considered. Where the pay-offs are treated in terms of utility theory one of the explicit assumptions is usually that the mere or actual playing of the game has no utility in itself. Whereas in educational teleconferencing the main value accrues from the actual interaction,while the credibility status achieved and whatever opportunity reward that may bring are of secondary importance.

One could arbitrarily choose some algorithm for game design and follow it through mechanically, but to do so would be to throw away a great deal of potentially valuable option-variety.

Instead of an algorithm, I have formulated three more or less independent (orthogonal) selection principles, or 'heuristics' these are : 1) Mutual-Reinforcement, 2) Requisite-variety to Noise Ratio, and 3) Formal-power These heuristics together with the goals and performance monitoring procedures, and the media-task relationships which have been discussed above provide a basis for the choice of a trial game design. Actual teleconferencing games must of course be developed in an iterative fashion through successive trials and revisions.

Mutual-Reinforcement implies that there should be positive-feedback loops linking people, and moreover since human communication is'chunked' that there should be reciprocity of initiation of chunks. i.e, people should take take turns. Hesslin and Dunphy's 'perceived freedom to participate' depends on the incorporation of reciprocally initiated mutual reinforcement arrangements. [11]

Requisite-variety to noise ratio implies that the variety of ignorance and ineptitude of the participants and the variety of'noise' (i.e. non goal-related transmissions & intrusions) will be counteracted and absorbed by the variety of knowledge and competencies of the participants when suitably orchestrated. (e.g. the 'each one teach one' game plan) A requisite variety of stored-information processing and delivery resources also is needed to complement personal knowledge if control of outcomes is to be achieved. [12]

Formal-power implies that a few modular components are used in a variety of logically consistent ways to efficiently realise the necessary game-plan and reward mechanism to achieve the common goals of the supporters and participants of the teleconferencing system. [13]

The Opportunity-Extending Credibility-Status Teleconferencing Game (OECSTG)

1)Communication the participants communicate via the telephone network (or other telecommunication network) either verbally or using devices such as a 300baud video-graphics ANSCII terminal. (Normally there is a round -robin convention and an input length limit per transmission. These conventions can be waived by group consensus, or be unused by individuals.)
Four modes of input are possible: i) broadcast to all participants via the common audio channel,or via a common workspace file, or both. ii) directed private dialogue with a selected sub-set of the participants iii) input of attention-time and probable-memorability rating indications to the scorekeeping monitor.
iv) queries to the monitor (e.g. what is my status rating now?) or queries to other utilities.

2)Binding Agreements can be entered into by coalitions of participants, in order to share credit for their work, but not to ignore or fail to cite other participants whose contributions they are actually using. All agreements must be recorded with the monitor.

3) Pay-offs are in three forms a) enhanced personal wisdom (= knowledge plus coherent values)and motivation which accrue to all participants in proportion to the time and depth of their participation.
b)Credibility Status, which is continually recalculated by the monitor. By contributing a conjecture ,refutation or comment a participant attracts the attention of others. Their measured attention-time multiplied by their rating of memorability and by their credibility status rating yields the increment to be added to the contributor's status. (to gain high status one should pay attention to low status people, and try and get high status people to pay attention to one's own contributions!) c) Resources allocated on the basis of the credibility status one achieves are:extra system resources, and access to personal tutorials, laboratories, think-tank weekends in the country &c.

4) Chance in the sense of random presentation of participants contributions in a weekly review, or in a review file would be used to increase the likelihood of good contributions receiving attention. Some system and programme resources should also be allocated at random in addition to those allocated according to credibility status, in order to damp the positive feedback runaway to maximum tendencies which otherwise would ensue.

5) Credibility Status may be shared among members of coalitions , by joint authoring of contributions. And the rewards accruing from status gains would then also be jointly allocated, if divisible.

Meta-system the OECS teleconferencing game might well serve as one of the primary subsystems in what I have described elsewhere as a 'Transparent University' Boyd (1975). [14]

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A MODEL OF SOME PSYCHOLOGICAL FACTORS IN TELECONFERENCING, INCLUDING SOCIAL RELATIONSHIPS, PARTICIPANT-SATISFACTIONS AND GROUP PERFORMANCE

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Introduction :
Teleconferencing is Basically not Psychologically Equivalent to Face-To-Face Conference

Rapid technological advances and widespread information systems have offered the possibility of developing teleconferencing using either audio or audio-video media. Teleconferencing was designed to enhance interactive communication between two or more groups of people in separate locations; enabling them to confer together in the same conference, at the same time, sharing values and exchanging ideas and views on subjects of common interest. The style and nature of the discussion is entirely decided by the organization and participants involved within the constraints of the technology employed.

Present practical application areas (e.g. education, medical, government, social, industrial and finacial organizations) suggest that a number of well developed teleconference networks have been in active operation. However, there are social, psychological and operational differences in modes of communication between teleconferencing and face-to-face meetings; and detailed studies and experiments are required to elucidate these. Teleconferencing is basically not psychologically equivalent to conventional conference. It is the purpose of this paper to show that teleconferencing can only be treated as an additional style of communication; but not a mere substitute for face-to-face meeting.

Psychologically speaking, participants converse with certain images in either audio or audio-video modes rather than with a person or group of people who are physically present. Members of each group involve membership of 'I-thou' relations among themselves but relationship between the groups via individual links has some characteristics of 'I-it' relationships. This particular aspect of teleconferencing substantially influences the general behavioural pattern of the groups. Consequently individual values and attitudes, interaction rituals and group processes in face-to-face meeting and teleconferencing are not necessarily identical. There are unique group-interaction profiles in teleconferencing. Several aspects of conferring,(e.g. task control, information orientation, opinion analysis, suggestion evaluation, length of conversation and frequencies of showing positive/negative reactions, etc.), have been found differ in during teleconferencing and face-to-face meetings. Furthermore, apart from psychological and social differences in the two conferencing styles, technical design of the system itself has suggested necessary operational divergences.

Studies of specific modes of communication and preparation, users'demand and attitudes, are essential in estimating the degree of successful implementation of teleconference facilities. Furthermore, a learning phase for designing to aid participants in accepting changes in their pre-conference activities is indicated. The desire to communicate and the way in which this takes place are conditioned by the nature of the interaction-patterns and physical atmosphere within teleconferencing (e.g. the degree of informality, flexibility, distracting effects and communication responses, etc.). We should therefore be aware and careful not to consider teleconferencing as a substitute for face-to-face communication without paying substantial consideration to their psychological differences. Participants who are conferring in 'I-it' (rather than 'I-thou') relation with remote images, will also encounter difficulties in tracing emotional signs of their recipients that are usually omitted in teleconferencing.

An improved understanding of the basic psychological core underlying teleconference and other human aspects, can only be achieved through multidisciplinary team work in conducting the necessary analysis (e.g. specialists of telecommunications, social psychology, system engineering, economics, ergonomics, etc.). The application of heterogeneous professional criteria, efforts and emphasis as contributed by these experts, will undoubtedly facilitate the system development. However, this can be achieved if each is willing to adjust or educate himself to accept sets of norms and values that are independent of his own expertise. There must be a working towards a recognized goal as a cooperative 'group' rather than as an 'aggregate' of specialists. The problems and solutions, information and analysis of each, are interrelated and of equal importance.

This paper discusses ways of analysing group behaviour and interaction patterns in teleconferencing. Its features can be interpreted in terms of an Equilibrium Model which consists of two interacting subsystems : the Conference Activities Inventory (CAI) and the Users' Behavioural Needs (UBN). CAI, which is the value-subsystem of the Model, represents the general behavioural patterns of participants and the basic nature of teleconferencing activities. Social Relationships, Participant-Satisfactions, Group Performance and Mission Completion are the major units of CAI. While UBN on the other hand, is the criterion-subsystem of the Model. It is classified into four specific levels : Acquisition, Acceptance, Specialization and Modification/Innovation. The purpose of UBN is to estimate the gradual growth and development in implementing the characteristics of teleconferencing into the whirl of CAI (figure 1). The four levels of the UBN-subsystem progress in a time sequence while the four units of CAI-subsystem integrate with time according to the progress of the UBN.

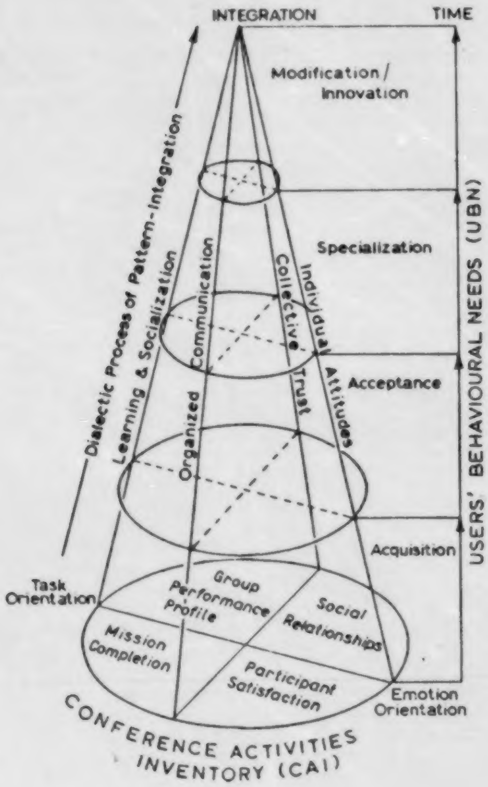
INTEGRATION
TIME
Modification / Innovation
Specialization
Acceptance
Acquisition
USERS' BEHAVIOURAL NEEDS (UBN)
Dialectic Process of Pattern-Integration
Learning & Socialization
Organized Communication
Collective Trust
Individual Attitudes
Task Orientation
Emotion Orientation
Group Performance Profile
Social Relationships
Mission Completion
Participant Satisfaction
CONFERENCE ACTIVITIES INVENTORY (CAI)

Figure 1 : The Equilibrium Model of Teleconferencing

An Equilibrium Model of Some Psychological Factors in Teleconferencing

CAI and UBN subsystems seek dialectically to reach the stage of equilibrium. New ideologies, ideas, or problems will be encountered at different levels along the time span (figure 2); synthesis at each level must be attained before proceeding to the next higher level. An element of 'continual change' is inherent in both CAI and UBN. This is the intrinsic force which maintains the internal dialectic processes of the model. On the other hand, it also prepares the subsystems for necessary responses to other external influences discussed below.

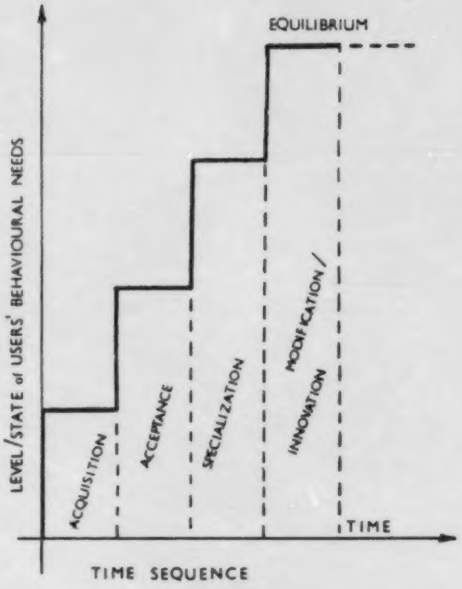

Figure 2 : Dialectic Progression of CAI & UBN towards Equilibrium

1. Conference Activities Inventory (CAI)

Conference Activities Inventory can be dichotomized along a functional continuum of Emotion- and Task- Orientation. The general nature of conferencing; namely : Participant-Satisfactions, Social Relationships, Group Performance Profile and Mission Completion, are regressing along this continuum. The first two patterns of conference behaviour tend to approximate to Emotion Orientation and the remaining polarizes to the category of Task Orientation. These four natures of teleconferencing themselves are a set of behavioural constructs derived from observation. Their qualities which include personal attitudes, collective trust, learning and socialization, and organized communication, are cumulative and are of a processing in a 'spiral' character. (figure 1)
The dialectic progress of pattern-integration is a series of socio-cultural and man-machine interfacing processes.

1.1 Emotion Orientation

'Individual Attitudes' and 'Collective Trust' are two fundamental values of emotion orientation of teleconferencing patterns. They are inherent in the two components of emotion-activities which are 1) Participant-Satisfactions in conferring with remote audio/audio-video images and with which 2) Social Relationships may be developed. There is no distinct boundary between the two components, because they gradually integrate among themselves as teleconference users grow increasingly familiar with the system.

1.11 Participant-Satisfactions

There are numerous emphases on individual preference to different levels of satisfactions. Individual attitudes towards teleconferencing are unpredictable. However, people's motives for attending conferences can be classified as :

a) to satisfy their self-esteem or self achievement in the conference by exhibiting their leadership, aptitudes, expertise, status, prestige, power, etc., i) to those at the conference and ii) to their colleagues outside.

b) to satisfy their needs for social-affection, being appraised and liked, meeting old friends, establishing new contact, seeking attention, or enjoying the occasion of social gathering and relaxation,

c) to attain a specific goal or purpose; for instance, exchanging ideas with other participants, information seeking, business promotion, etc.,

d) even to 'escape from the office and telephone'.

Teleconference system must be designed to accommodate the above conferencing capacities with an additional consideration of the 'visual orientation' factor. Since teleconference participants are interacting with audio/audio-video images, some basic values are essential and must be taken for granted. Thus, a) Users must be able to 'look' at one another; this is a social act in itself and is also important to the 'I-it' and 'I-thou' distinction.
b) To meet the gaze of another is a significant event, which is an important part of the goal sought in an interaction.
c) In seeing another, much important information (about whom) may be gathered in addition to the direction of gaze.

Therefore, in order to comply with the participant-satisfactions in teleconferencing, the functions of 'visual orientation' during interaction must be achieved. They are playing the role of information-seeking, signalling an open-channel, concealment and exhibitionism, establishment and recognition of social relationships during interaction (Argyle & Dean; 1965)[1].

1.12 Social Relationships

There are 'basic elements' to attract and determine current and potential teleconference users to develop social relationships within their own group and with other remote images. For instance, the two groups might start to compete. Members have loyalty to own group and a different one to the other group. The value of 'collective trust' between individual users and other remote-user-images is the basic essence of developing a successful relationship. The basic elements are :

a) Interaction Rewardingness

This determinant of satisfactory social relationships is based on the exchange approval, mutual acceptance and attitude support of users-parties. Teleconference participants have to realize that it is possible to develop a social relationship with remote images and at the same time, admit that the relationship is rewarding and trust-worthy.

b) Value-Similarity

Teleconference participants have to share a balanced view and a consistant value-background about the system prior to their understanding of the motives and behaviour of others. A new form of 'trust' must be generated among conference participants.

c) Feeling of Propinquity

One of the characteristics of teleconferencing is the interaction with remote audio/audio-video images. This deviates from the accustomed rituals of face-to-face conferencing that may give rise to a number of psychological considerations : the role and physical location of the chairman, the sense of availability of remote-recipients, possibility of developing continued interaction, predictability of recipients' motives and intension, and familiarity with the teleconference exposure. These are the major variables which link with the feeling of 'nearness' during the interaction with remote images.

Deutsch (1962)[2], for example, argues that 'trust' is the central prerequisite of cooperation. The quality of teleconferencing therefore is related closely to the degree of 'collective trust' developed by participants. This value will not only influence the participants in realizing that their interaction is rewarding, but also develop a feeling of psychological propinquity, so that the quality of teleconferencing will consequently be improved. (figure 3)

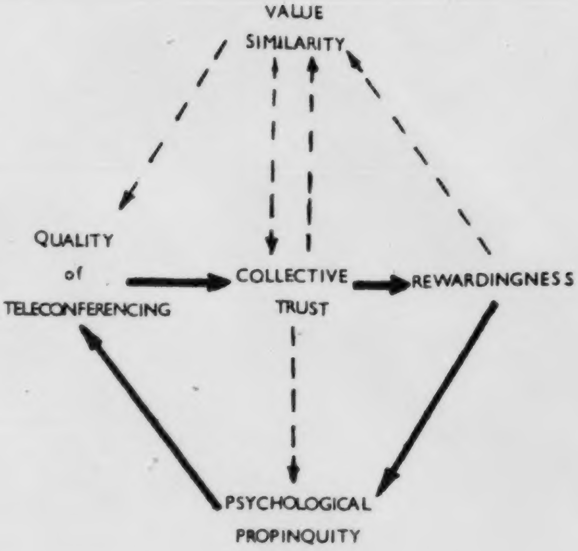

Figure 3 : Social Relationships of Teleconferencing

1.2 Task Orientation

The other polarity of the functional continuum of Conference Activities Inventory is Task Orientation. This composes two units : 1) Group Performance Profile and 2) Mission Completion. The former is a description of interaction-profiles of conferencing groups while the latter is the operating functions of various organizations and institutions which have permitted the implementation of the teleconference system.

1.21 Group Performance Profile

Bales Model of Interaction Process[3] is used to describe the group performance of teleconferencing. This is a highly idealized and schematized conception of standardizing group interaction. In actual operation, all functional interactions are potential at any given time within the total span of meeting. Any specific element of conferencing : orientation, evaluation, control, decision, tension management and integration, is occuring only as a matter of relative emphasis. However, all of them are existing in cumulative effects during the continuous group process. Besides, the separate conferring groups have a high likelihood of coming from different organizations, decided by geography and so may be partial strangers. The group loyalties and the separate groups cross-loyalties and trusts may differ a priosi. Teleconferencing increases such risks.

There are unique group performance profiles in teleconferencing which are influenced by external conditions : users' personalities and preference for the teleconference system, characteristics of conferring groups, nature of discussion and technical design of the system. (figure 4)

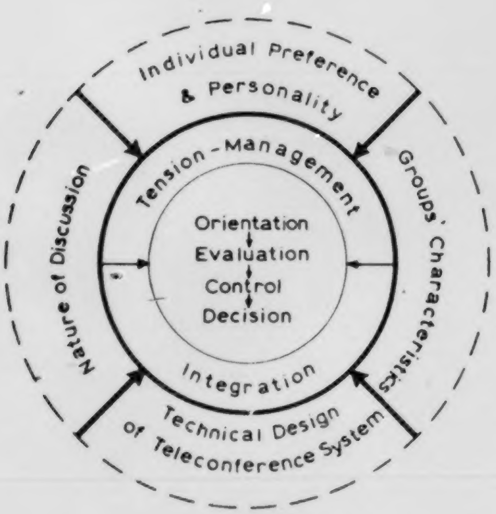

Figure 4 : Generalized Group Performance Profile of Teleconferencing

The six elements in the inner circle (figure 4) are fundamental ingredients of all teleconferencing. Different degree of emphasis of each external condition (outer circle) will mould the group performance profiles into various unique features. If we are concerned with the group process according to this figure, we can assume that there is a general tendency toward its regular pattern of group interaction. To illustrate, we can see no difficulty in imagining two teleconferencing groups, meeting for a certain period, dealing with a single major topical problem, and coming to a successful conclusion; the order of events might be something like the following order : to get an initial factual/cognitive orientation to the problem, followed by analyzing and diagnosing the situation in the lights of values, needs, and desires of the groups that involve learning and socialization processes of their members. The next phase is devoted to finding means of controlling factors in the situation that includes the activities of all physical-present members and remote images; then decision of the intent might appear. The elements of emotional reactions (showing tension and integration) of group members will appear as interludes during the whole process.

1.22 Mission Completion

The final construct of teleconferencing is a set of 'organized communications'. This refers to the application of a teleconference system in various functional organizations and institutions. Demonstration programs using a teleconference network[4,5&6] in traditional and novel educational environments, continued experiments on the use of random-access-system facilities in health care delivery[7,8], the impact of teleconferencing in finance and commercial[9,10,11,12&] administration[13], and organization decentralization programs[14,15], the adverse impact of the system in regional development and transport systems[16,17&18], and the operation within the deaf community[19], etc., are the few examples and evidences to show that teleconference system is practical and comprehensive.

Diffused institutions/organizations have been applying teleconference networks and are sharing a number of basic activities to fulfil specific functions and purposes. These functional characteristics of teleconferencing are depicted in figure 5. The similarities between those organizations and their relations to categories of teleconferencing purposes/activities are self explanatory.

The task- and emotion- orientation continuum of the CAI has shaped the basis of conferencing conducts. They are integrating and progressing together with the UBN subsystem along a time span. The four natures of conferencing : Social Relationships, Participant-Satisfactions, Group Performance Profiles and Mission Completion, are suffering from common elements - the sense of unfamiliarity to interact with remote-images and the establishment of cross-loyalties and trusts among/within groups. These psychological uneasiness and estrangement are the core of researches in designing the UBN subsystem which shall be discussed in the next section.

FUNCTIONAL INSTITUTIONS

PURPOSES	EDUCATION	SERVICE & SOCIAL ORGANIZATION	MEDICAL SERVICE SYSTEM	FINANCE AND COMMERCE	GOVERNMENT
Orientation/ Information Exchange	*	*	*	*	*
Administration	*	*			*
Clarifying, Queries & Instruction			*	*	
Problem Solving		*	*		
Profit Making / Marketing		*		*	
Education Service & Occupational Training	*	*			*
Institutional / Legal System Promotion					*
Regional Development & Community Integration		*			*
Organztional Development	*		*		
Decision Making				*	
Medical Care / Health Service Delivery		*	*		
Cultural Expansion & Entertainment		*			

Figure 5 : Distributive Functional Relations between Institutions and Teleconferencing Purposes

2. Users' Behavioural Needs (UBN)

The four levels of Users' Behavioural Needs (UBN) subsystem : Acquisition, Acceptance, Specialization and Modification/Innovation are the dynamic components that enhance the dialectic process of the four patterns-integration (CAI). Both CAI and UBN subsystems are playing complementary roles in maintaining equilibrium stage of system growth. The basic principles inherent in each level of the UBN subsystem will be analysed in a time sequence order with reference to figure 1.

2.1 Users' Acquisition

The teleconference system is a relatively 'new' communication technology which involves 'new' styles of preparing for the conference, 'new' ways of operating the system and 'new' manners of interacting with recipients. These unconventional rituals of conferencing which are deviations from the usual mode of spontaneous communication, require exertions of current and potential users. Individual consciousness in teleconferencing entirely depends on sufficient understanding of one's attitude toward the system and the degree of personal satisfactions. These will be obtained from formulating the new pattern of social relationships during the operation. A ratio of Within Studio Acquiantance/Between Studio Acquaintance (Christie;1974)[20] is also computed to estimate this interaction pattern.

The second component of the UBN's Acquisition Level is system recognition. It involves both subjective opinions and objective learning experience of users to discover what the system really is and how it actually works. The integration process of CAI with this level is mainly regressing on the basis of passive intaking experience of users. When potential users are exposed to the teleconference system, they can proceed to a further step of the UBN subsystem.

2.2 Acceptance

At this level, teleconference participants tend to increasingly assume active roles in accepting this new mode of communication. Individuals are gradually formulating their own values/views on the system. The possibility of developing a collective trust among participants is the prerequisite of its successful application. Two kinds of value-formation are formulated : 'Sentiment-Preference' for like versus dislike of the system itself; and the 'Unit-Relation' which refers to some common bonds for attracting people to agreeably with the system.

Analogy of acceptance (figure 6) can be expressed in terms of the Similarity-Attraction Principle.[21]

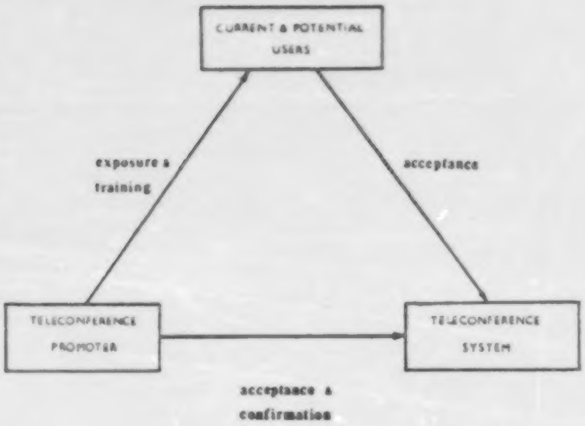

Figure 6 : Similarity-Attraction Principle of Teleconferencing

We assume that the relations among the teleconference promoter, current and potential users, and the teleconference system (as an object) can be depicted as a triad. The level of acceptance can be achieved if the relations of the three components are positive. It means that if teleconference promoters' perception of and the users' reaction to the teleconference system are satisfactory; the acceptance level of the UBN subsystem has arrived at its equilibrium stage. Otherwise, the tendency to 'change' will occur in three alternative ways : to modify the present teleconference system itself, to attempt to influence users' feelings and views about the system, or to reconstruct the introducing/promoting strategies (e.g. training and exposure trials), in order to attract both parties towards sharing a similar attitude to the teleconference system.

2.3 System Specialization

The teleconference system has been applied to diffused areas of institutions as an alternative system of communication. Teleconferencing plays different roles in different organizations; for instance, serving a) as a mean of 'Intracommunication' to improve internal communications within/between plants, b) as an 'Extension' to strengthen the services of an institution into a community, c) as a 'Common Carrier' seeking to provide additional services, and d) as an 'Inter-Institutional Organization' to provide better coordination and exchange of information between its member institutions.[16]

Together with the integration process of the CAI subsystem, all applications of teleconference systems (e.g. medical, educational, governmental and industrial) can be classified into four common modes of interaction : One-to-One, One-to-Many, Many-to-One and Many-to-Many. Selection of communication modes is determined by the specific area to which teleconferencing is applied. Basically, each teleconference system includes more than one mode; for instance, interaction patterns of 'One-to-One' and 'One-to-Many' conditions occur in most systems while a participant is addressing any particular other (that may also include the chairman) or addressing general conferencing groups. However, in the 'Many-to-One' situation, a common occasion will be when participants are conferring with audio images, in which case there is a limited ability to 'foresee' who is the intended speaker without any specific built-in device; the 'cross-talk' problem is therefore occuring frequently. The case of 'Many-to-Many' communication is most obvious when a conference may develop into a chaotic situation that teleconference designers and users are most anxious to avoid.

2.4 Modification/Innovation

This is the final and the most critical stage of the UBN subsystem. Although the teleconference system has reached its equilibrium state in integrating the users' acceptance and operational mode with the four components of the CAI, there are certain existing problems which require immediate attention. The teleconference system, as a technological device, should not be adopted in various social contexts without thorough considerations of a) its rating for survival, b) economic necessity, c) development opportunity and d) the probability and possibility of becoming a socially accepted as 'goods and service'. In order to avoid oversimplified decision on its value and utility, we need to explore its effectiveness for satisfying demands and its impact on social relations. The implementation of teleconference-technology will give rise to external changes in the communication sector. However, a society needs to make social adjustment if a technical innovation is actually to become adopted. In view of the speed of the present technical advancement, this problem is urgent. It is then essential to study the specific demands and value backgrounds of the social context.

No technological device can be successfully implemented in any social context without struggling up the basic social ladder of 1) Acquisition by and Acceptance of users, and 2) the Specialization and Modification procedures of the system itself.
This can be applied to the analysis of teleconference systems in functional institutions. The Conference Activities Inventory is the social context of conferencing while the subsystem of Users' Behavioural Needs is the timing device for measuring the developing progress of the system.

Conclusion :
Some Suggestions for Training Procedures and Behavioural Modifications to Teleconference Participants

Research and experience have already demonstrated that Teleconference Systems, both as technical aids and as new styles of conference, may be progressively improved. An Equilibrium Model which integrates the two subsystems : Conference Activities Inventory (CAI) and Users' Behavioural Needs (UBN), has been constructed and analysed in details. Four basic values are inherent in the dialectic processes of task- and emotion- activities of teleconferencing behaviour. Social relationships and personal satisfactions can only be achieved with the internalized values of collective trust between participants and individual recognition of the characteristics of teleconferencing. Participants are conversing with remote-images rather than physically present individuals. On the other hand, learning experience and organized patterns of communication can enhance better group interaction and may facilitate certain functional objectives effectively and efficiently in diffused institutions where teleconferencing has been applied.

The growth of CAI relies entirely on a developing ladder of UBN. On the other hand, the latter progresses along a time sequence. A teleconference system can therefore be presented to current and potential users via the user and system approaches. Procedures of acquisition and acceptance levels for participants include complicated learning experience and socialization processes, while the specialization level (of the UBN subsystem) involves careful selection of specific modes of interaction to attain the functional objectives of institutions. The modification/innovation level is designed to seek further understanding of the cultural environment in adapting the teleconference system to any specific social context. Full capacity and maximum effectiveness of the system can only be obtained if all components of the CAI and UBN subsystems are thoroughly considered and studied.

The theoretical model of some psychological factors in teleconferencing has been comprehensively discussed. However, since many of the accustomed rituals of conventional conferences are not relevant to teleconference systems, there may be some reluctance on the part of participants to accept such systems. This further indicates that there should be the least degree of modification and minimal training for users. Training should aim to overcome these difficulties and distaste : personal unfamiliarity with the system, unexpected risks which may occur during operations, and their unwillingness to change present acquired behaviour. The Level of Adjustment Model[22] (figure 7) to achieve this aim, will be discussed in the presentation of this paper.

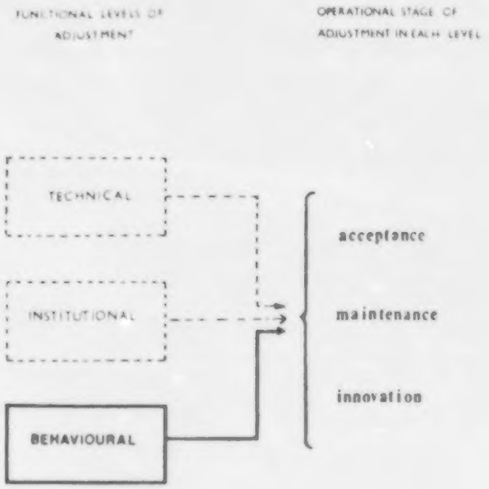
FUNCTIONAL LEVELS OF ADJUSTMENT
OPERATIONAL STAGE OF ADJUSTMENT IN EACH LEVEL
TECHNICAL
INSTITUTIONAL
BEHAVIOURAL
acceptance
maintenance
innovation

Figure 7 : Levels of Adjustment

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INTERROGATIVE BEHAVIOR IN BUSINESS TELEPHONE-COMMUNICATION[1]

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The purpose of this study was to predict the type of communication technology which will replace the telephone as a means of business communication by the year 2000AD. The report describes the parameters of interrogative telephone communication behavior in order to predict alternative communication media for future business communication. Specifically, it presents the findings of an analysis of interrogative communication behavior in business telephone conversations and draws forth implications for future communication technologies.

This study applied a content analysis system to the questions appearing in typed transcripts of 2 hours of regular business conversations. The transcripts were provided by Xerox Corporation and represented the telephoned business communications of Xerox executives.

The Content Analysis System

Charles Redding of Purdue University has categorized questions into 11 classifications and the content analysis system used in this study built upon Redding's classifications. Redding's question types follow:

1. Questioner Antecedent Question: This type of question refers to a topic last treated by the questioner.

2. Answerer Antecedent Question: This type of question refers to a topic last treated by the answerer.

3. Immediate Question: This type of question refers to a topic last treated in the prior question or answer.

4. Remote Question: This type of question refers to a topic last treated before the immediately prior question or answer.

5. Open Question: This type of question allows the respondent a wide area for response.

6. Closed Question: This type of question limits the area of response of the respondent.

7. Indirect Question: This form of open question fails to specify or specifies very wide response possibilities for the respondent.

8. Probe: This form of open question does not necessarily end with a question mark and encourages the respondent to continue his response. Only statements which reappeared from the last part of a response (mirror probes) were included in this analysis.

9. Direct Question: This form of closed question narrowly defines the response parameter of the respondent.

10. Bipolar Question: This form of direct question offers the respondent two response options.

11. Multiple Choice Question: This form of direct question offers the respondent several specific response options.

The content analysis system adopted for this study builds upon Redding's taxonomy and the twenty categories follow:

1. Questioner antecedent immediate open indirect question.

2. Questioner antecedent immediate open probe question

3. Questioner antecedent immediate closed direct question.

4. Questioner antecedent immediate closed bipolar question.

5. Questioner antecedent immediate closed multiple choice question.

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6. Questioner antecedent remote open indirect question.

7. Questioner antecedent remote open probe question.

8. Questioner antecedent remote closed direct question.

9. Questioner antecedent remote closed bipolar question.

10. Questioner antecedent remote closed multiple choice question

11. Answerer antecedent immediate open indirect question.

12. Answerer antecedent immediate open probe question.

13. Answerer antecedent immediate closed bipolar question.

14. Answerer antecedent immediate closed direct question.

15. Answerer antecedent immediate closed multiple choice question.

16. Answerer antecedent remote open indirect question

17. Answerer antecedent remote open probe question.

18. Anwerer antecedent remote closed direct question.

19. Answerer antecedent remote closed bipolar question.

20. Answerer antecedent remote closed multiple choice question.

Results

Table 1 describes the parameters of interrogative behavior in two hours of taped business telephone conversations. The table reveals that questioners refer back to their own communication behavior in 52% of the cases while they refer back to the answerer's communication behavoir in 48% of the cases. The results also tell us that 59% of the questions refer to the question or answer immediately prior to the question while only 41% of the questions look back to investigate some topic discussed at some previous point in the interaction.

Table 1 also describes the nature of response demanded by questions in business telephone conversations. Sixty-nine percent of the questions are of a closed nature allowing the respondent a narrow range of response while only 31% are open and allow the respondent a wide range of response. Of the closed questions 96% are direct, 39% are bipolar and less than .01% are multiple choice questions. Of the open type questions 61% are indirect and 39% are probes.

Second Order Results

Table 1 reveals that questioner antecedent remote questions comprise 33% of the total number of questions asked while the questioner antecedent immediate questions comprise 18% of the total questions asked. On the other hand, answerer antecedent immediate questions comprise 40% of the total questions asked while the answerer antecedent remote category has 15% of the total number of questions asked.

Third and Fourth Order Results

The table reveals that questioner antecedent immediate closed questions comprise approximately 15% of the total number of questions and of these 14% are direct and less than 1% are bipolar. Questioner antecedent immediate open questions comprise 4% of the total number of questions and 3% of these are classified as probes while less than 1% are indirect questions.

Questioner antecedent remote closed questions comprise about 29% of the total number of questions and of these 28% are direct and less than 1% are bipolar. Questioner antecedent remote open type questions represent 4% of the total number of questions and these are all indirect questions.

Answerer antecedent immediate closed questions comprise 20% of the total number of questions and 19% of these are direct while both bipolar and multiple choice questions represent less that 1% of the total. Answerer antecedent immediate open questions also represent 20% of the total questions and of these 15% are probes and the remaining 5% are indirect questions.

Answerer antecedent remote closed questions represent 5% of the total number of questions and each of these is a direct question. Answerer antecedent remote open questions represent 2% of the total number of questions and these are all indirect questions.

Conclusions

The content analysis of business telephone conversations points to the following conclusions:

1. The content of questions in business telephone conversations can be traced to the prior communications of either the questioner or answerer. If the question refers back to some remote comment of the questioner it will probably be a direct question (85% of the cases). If, on the other hand, the question refers back to the answerer, the question will probably be immediate (85% of the cases) and will probably be of the closed direct form (46% of the cases)

2. Most questions emerge directly from the prior question or response (50%) while a minority treat some past topic of the conversation (41%). Immediate antecedent questions are both closed (53%) and open (47%) while remote antecedent questions tend to be closed in the majority of cases(87%).

3. Most questions specify the parameters for response quite narrowly (69%) while only 31% allow the respondent to wander at will. This suggests that interviewing behavior over the telephone can be classified as directive or closed rather than open.

4. The direct question is the most heavily used question in business telephone conversations (67%); probes rank second comprising 18% and open questions rank third (12%).

5. The relatively high percentage of questioner antecedent remote closed questions (29%) suggests that closed direct questions are used to introduce a new topic or reintroduce an old topic.

Implications

New technologies will probably fail to completely replace the telephone bacause this medium allows the questioner to:

1. establish personal contact

2. pursue his own line of questioning

3. investigate the answerer's remarks

4. introduce and reintroduce question areas

5. specify the nature of response desired

New technologies will only be able to supplement the telephone and these technologies might include recorded messages, group teleconferencing and multi-modality phones.

Much telephone information seeking behavior deals with schedules, appointments and the like. Perhaps such schedules and appointments could be recorded at some central number and be retrievable by dialing that number. This would save time for the both parties.

Group teleconferencing is another area where innovations could be achieved. Much information transmission takes place by means of a series of telephone conversations treating the same topic. Perhaps the caller could contact several interested parties simultaneously and relay the message at the same time. Questions from one participants will elicit answers for all participants.

Another supplemental systems could make the communicative process more complete by adding new sensory modalities to the communicative interaction. For example, the use of audio-videophones could provide the interactants with supplemental visual material to aid in the communication process. One videophone camera could focus on schedules, designs and plans on a desk or board while the other could focus on the speaker. The viewer could switch from one to another at will. The desk camera would allow the communicator to designate specific areas of focus on the display which supplemented by the sound would present a more comprehensive interaction process. This innovation would allow more direct questioning which achieves a specific response and reduces the need for unnessary communication. However, these systems can only supplement the telephone as a medium of communication.

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TABLE

FREQUENCY OF QUESTION TYPES AND PERCENTAGE OF THOSE TYPES IN TWO HOURS OF BUSINESS COMMUNICATION BY TELEPHONE

	f	%N		f	%N		f	%N		f	%N
QUESTIONER ANTECEDENT	142	52	Immediate	51	18	Open	10	4	Indirect	2	.7
									Probe	8	3
						Closed	41	15	Direct	39	14
									Bipolar	2	.7
									M-Choice	0	0
			Remote	91	33	Open	12	4	Indirect	12	4
									Probe	0	0
						Closed	79	29	Direct	77	.28
									Bipolar	2	.7
									M-Choice	0	0
ANSWERER ANTECEDENT	129	48	Immediate	110	40	Open	57	20	Indirect	15	5
									Probe	42	15
						Closed	53	20	Direct	51	19
									Bipolar	1	.3
									M-Choice	1	.3
			Remote	19	7	Open	4	2	Indirect	4	2
									Probe	0	0
						Closed	15	5	Direct	15	5
									Bipolar	0	0
									M-Choice	0	0
TOTAL	271	100%		271	100%		271	100%		271	100%

A REVIEW OF PSYCHOLOGICAL RESEARCH COMPARING COMMUNICATIONS MEDIA

by

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Considering that the telephone has been around for 100 years and formal education for even longer, it is surprising that only recently has the telephone been envisaged as having an important place in education. Part of the reason for this lag may be the very reasonable suspicion that the use of a communication medium, rather than face-to-face, will alter various important psychological processes. Only recently have researchers begun to measure systematically media effects on psychological processes. Until about 1970, new telecommunications media or systems were evaluated by those who designed them. The criterion for success was simple: If people could communicate via the new medium, then it was a success. This approach showed that people could communicate via all kinds of strange media, such as Morse code, semaphore and Picturephone®. A great deal of contemporary work on telecommunications systems is still of the same character. It consists merely of demonstrating the feasibility of some sort of telecommunication system.

This kind of development and evaluation process never answers three important questions:

(1) How effectively can people use a medium or system for diverse communication purposes?

(2) From the user's standpoint, how does any particular system compare with viable alternatives?

(3) Even if people could communicate via these media, would they when given the choice?

As is usually the case with advanced technology, engineering developments in telecommunications have generally outstripped our understanding of the human implications of that technology. However, a number of researchers are now working to rectify this situation by systematically comparing face-to-face communication with communication via various electronic media. It is this research that we propose to summarize. Most of these studies have been carried out in the laboratory, but we will also refer to some fieldwork. About thirty true experiments have been completed to date: mainly at University College, London, and at Johns Hopkins University. These experiments all have the following format: many groups of two or more people (mainly students and civil servants) come to the laboratory, where they are assigned by some random process to communicate face-to-face or through some communications medium. The media have included two-way closed circuit television, loudspeaking audio, telephone, interactive teletype and telehandwriting devices. The subjects are given a standard task, and carry it out, communicating via the assigned medium for some period of time. Measurements of their behavior and speech are taken, and they may fill in a questionnaire after the conversation. These data are reduced to numerical form and subjected to statistical analysis to determine if the differences observed in the performance of the groups assigned to the several media are greater than could be expected by chance.

For our purposes here the experiments can be most usefully categorized according to the type of task carried out.

TASKS THAT SHOW NO MEDIA EFFECTS

Four types of task have shown no differences between telephone and face-to-face (the media of most interest to this conference):

Information transmission

Champness and Reid (1970)

Davies, M. A. (1971)

Results show no differences among face-to-face, audio-only and written media.

Problem solving

Champness and Davies, M. F. (1971)

Davies, M. F. (1971a)

Davies, M. F. (1971b)

Woodside, Cavers and Buck (1971)

Chapanis, Ochsman, Parrish and Weeks (1972)

Chapanis and Overbey (1974)

Ochsman and Chapanis (1974)

Weeks and Chapanis (1976)

Results show no differences between face-to-face and audio-only, but written media, e.g., teletype, are much slower than those that have a voice channel.

Generating ideas

Williams (1975a)

Results show no differences among face-to-face, television and audio-only.

Interviewing

Reid (1970)

Janofsky (1971)

Young (1974a)

Results show no differences among face-to-face, television and audio-only.

TASKS THAT DO SHOW MEDIA EFFECTS

On the other hand, for four other types of task, media effects have appeared:

Getting to know someone

Klemmer and Stocker (1971)

Williams (1972)

Williams (1975b)

The latter two of these experiments showed that people who have met face-to-face, or by television, are judged more favorably than people who have met by telephone.

Persuasion

Short (1972a)

Short (1972b)

Short (1972c)

Short (1973)

Young (1974b)

Weeks and Chapanis (1976)

Most of these studies showed there to be more attitude change after interactive persuasion by audio communication, than in face-to-face communication. Interactive television was most like audio. In the 1st, 3rd, and 4th experiments, the effect was large enough to be statistically significant.

Negotiation

Morley and Stephenson (1969)

Morley and Stephenson (1970)

Short (1971a)

Short (1971b)

Weeks and Chapanis (1976)

Various media effects have been reported. The person with a stronger case and the person arguing a brief appear to do better in telephone communication than in face-to-face situations.

On the other hand, there appear to be more breakdowns in negotiation by telephone than face-to-face.

Detection of lying

Reid (1970)

Krauss (Personal communication)

The latter study suggests that lies can be more accurately detected by audio-only than face-to-face.

A number of interpersonal and group processes have also been shown to be effected by medium of communication:

Coalition formation

Williams (1973)

Williams (1975a)

The former study showed no medium effect, but the latter showed that people tend to agree with others at the same end of a teleconference link, and disagree with people at the far end.

Balance between cooperation and conflict

Wichman (1971)

LaPlante (1971)

Both studies showed more conflict in Prisoners' Dilemma games played by telephone than games played face-to-face.

Obedience

Milgram (1965)

People were less likely to obey orders when these were given by telephone rather than face-to-face.

The studies reviewed above constitute an impressive body of knowledge regarding the effects of medium of communication on psychological process. They constitute the background information which can be used to predict whether any particular usage of communication media is likely to be successful.

FIELD STUDIES

Since some people criticize laboratory studies as lacking the realism of everyday use of telecommunications, it is important to point out that several laboratory results have been confirmed by studies of the attitudes of users of teleconference systems. Figure 1 shows the combined results of four studies (Stapley, 1973; Champness, 1973; Williams and Holloway, 1974; Thomas and Williams, 1975) in each of which about 200 users were asked to state how suitable the telecommunications system they had just used would be for various types of tasks.

Two things stand out in Figure 1. First, the task itself is the primary variable that affects ratings of satisfactoriness, with the "unsatisfactory" tasks being the ones that laboratory experiments showed to be affected by medium of communication. Second, compared to the effects of task, the differences between the audio-only and the video media are modest. This latter result parallels those of the laboratory experiments which showed that in most cases, video and audio were fairly similar.

Figure 1 Satisfactoriness of Four Telecommunications Systems for Various Tasks

	COMPLETELY SATISFACTORY				COMPLETELY UNSATISFACTORY	
Giving or Receiving Information	A V	v a				
Asking Questions	VA	v				
Exchanging Opinions	VA	v				
Problem Solving		Vv	A			
Generating Ideas		Vv	A			
Persuasion			V avA			
Bargaining			V av	A		
Getting to Know Someone			V	v	aA	

V is British Post Office Confravision (video)

v is Bell Canada Conference Television

A is University of Quebec audio system

a is Remote Meeting Table (audio)

IMPLICATIONS

What are the implications of these results for the use of telecommunications in education? First, it seems that the tasks that most frequently occur in educational settings--giving and receiving information, asking questions, exchanging opinions and problem solving--are tasks for which telecommunications are as effective and acceptable as face-to-face meetings. Second, it seems that complex and expensive video systems are unnecessary for such tasks: very much cheaper and simpler audio systems are just as suitable. A major conclusion of these psychological studies, then, is that the telephone, and other audio-only systems, have a very promising future in education.

Why, then, are they not more widely used? Why is it only in the last decade that the telephone has been used in educational contexts by such pioneering institutions as the University of Wisconsin-Extension, the University of Quebec and the Open University? One reason may be that good conference telephones for group use have only become available recently. However, this is not the complete explanation, and we conclude with a quotation from Short, Williams and Christie (1976), "Teacher attitudes have been in the past (and seem likely to continue to be) an important barrier to increased use of a technology whose principle attraction for the administrator may be that it can partially replace teachers. Recent reviews (e.g., Howarth, 1974) have thus been pessimistic about the application of new telecommunications by existing educational institutions. The real significance of the new technology lies in its promise of extending education to the non-traditional students: those who for a variety of reasons could not or would not attend existing institutions. The institutional problems are bypassed when one is dealing with the non-traditional student."

Recently there has been a noticeable trend toward the extension of our education system to accommodate and upgrade the skills of older, already-employed persons. These may be precisely the kind of non-traditional students for whom telecommunications would provide the greatest benefits.

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TEACHING BY TELEPHONE FOR DISADVANTAGED AND REMOTE STUDENTS

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Not all Open University students are able to make use of the face to face tutorial service provided for them. Some of these students are housebound, others live too far, in terms of time, effort and cost, from the Study Centres to attend. The telephone seems to be one alternative to maintain regular two-way contact with these disadvantaged and remote students and to provide them with a group learning experience.

The telephone in adult education

It is a feature of most adult education, especially at university level, that it cannot depend upon a campus, that it is part-time and that it has to fit into the normal schedule of the working adult since it necessarily takes second place to his job. This means that adult education must be highly flexible in its arrangements. This is why much of adult education is decentralized, centred on local education institutions and local teachers. Decentralization however, may endanger standards and lead to parochialism and this needs to be countered by widening the framework and scope of the institution.

The Open University has set out to create a highly centralized national teaching system combined with a localized tutorial support service, thereby benefitting from economies and advantages of scale while not neglecting the merits of person to person contact at the regional level.

But even with our 260 Study Centres spread throughout Britain, there are many students who cannot attend either because they are housebound (through ill-health, disablement, family commitments etc) or because they live too far, in terms of travel time and cost.

What we require therefore is a flexible additional medium to help them with their studies. It is this requirement of flexibility, which characterises telecommunications in a high degree, making it so suitable as a medium for our purposes.

Recently we discovered the telephone as an additional medium which has the special advantages that it is instantaneous in establishing contact between people and that it is two-way. Lacking the visual element it nevertheless enables us to convey most kinds of knowledge to people at a distance. Furthermore, although the telephone is primarily an instrument for individuals it is now capable of adaptation for wider group use. But even here it is selective and not indiscriminate, like broadcasting, and it is obviously an advantage in education.

Although the correspondence unit is the heart of our teaching system and we consider the student to be primarily home based, it is common for the lone learner to come up against a problem he cannot solve by himself. In such event we encourage the student to use the telephone to contact his tutor. In some regions the 'telecard' system is in use. Students who are considered disadvantaged are given a number of cards which allow them a specified number of free calls to their tutor to clear up academic problems. In addition, students often maintain telephone contact for mutual support and encouragement.

Teaching by telephone in the conference mode

But individual calls have their limitations. For the tutor they are costly in time and money and, for the student, there is no sense of community. This is why we began a project using telephone conferencing for teaching students in their homes. This project, which is unique in the world, uses the Post Office Faraday conferencing facility, the most elementary multi-point audio-conferencing method available to us. The method is relatively cheap, especially on STD calls and requires no capital outlay on our part. It is particularly useful for the housebound or remote student and these have been the nucleus of our groups. Tutorials normally last an hour at monthly intervals and generally settle down into a cosy social unit after one or two sessions. Telephone tutorials are rather strenuous for the tutor who needs to be a firm chairman while yet allowing everyone to come into the discussion.

Most people require some practice in non-visual communication, especially when several people are linked together trying to grapple with some academic problem. On the other hand we have found a high degree of acceptability once students are introduced to the technique and the results have been documented by Holloway and Hammond in a report for the Communications Study Group. There is no reason to believe that students benefit less from telephone tutorials than from face to face, in fact some students say that the slower pace and more individual contact suits them better. Dr. L. Parker has dealt with comparisons of face to face and telephone teaching in his recent paper 'Teaching by Telephone at the University of Wisconsin', USA, 1975.

On the technical side, the Faraday system leaves much to be desired and the poor lines are not uncommon. But if motivation is high, as is the case with our students, and if participants are forewarned of difficulties, it is possible to hold full-length discussions on a regular basis. The service would be enhanced if setting up could be achieved at much shorter notice than the present 24 hours and if the Post Office increased capacity by establishing amplifiers at all main exchanges. The conventional handset is also a handicap for calls of long duration and the provision of headsets should be facilitated at low cost.

While the Open University use of the Faraday facility has largely been to provide tutorials to stable groups of students each located at his home, stability of location is not an essential ingredient of this method. It is perfectly possible for anyone to change his location and for participants to be added or subtracted provided enough notice is given, and this is a feature of major importance fitting in with the flexibility needed in adult education mentioned earlier. Telephone teaching is a service we can provide to students wherever they may be and their tutor may equally be located anywhere in the country. In fact even the latter requirement is not all that rigid and there are cases of tutorials being conducted for higher degrees by British professors to students in New Zealand, though on a one to one basis.

The scatter problem

At present the logistics of tutorial provision in the Open University are complicated by what I shall call the student scatter problem. Apart from the difficulty of remoteness of students in inaccessible places like the Isle of Man or the Hebrides where the cost of sending tutors is prohibitive, we also have difficulty in congregating students in sufficient numbers to be economic on many of our higher level, low student population courses. As the university puts on more courses to cater for our more advanced students so student numbers on each individual higher level course falls, which means that numbers in any locality fall as well.

Telecommunications seems to offer a way out of this problem. Since we still require Study Centres for our large population courses, particularly at foundation level, we want to use these centres for tutorials on the telephone. By installing a loudspeaking device two or more students can participate in a tutorial together with similar groups located at other Study Centres or simply with a tutor at a distance. The method is being used nightly in the Liverpool-Isle of Man link-up, in Wales and other regions. It offers the best solution to the problem presented when a suitable tutor is not available locally or when an esoteric course requires a specialist tutor only to be found far away. In this way expertise can be made available where it would be impossible to do so economically otherwise.

The device used commonly is the British Post Office Loudspeaking Telephone, sometimes with extension microphone and speaker. This device was intended for the administrator's desk and not for a classroom with poor acoustics and our use has affected quality. Volume is often inadequate and the microphone insufficiently sensitive to pick up speech at a distance of more than three feet leading to often disastrous clipped speech. We discovered, however, that this problem could be overcome to a certain extent by speaking directly into the extension microphone which is handed round the group.

Unlike other telephone teaching systems, we have resisted the press-to-speak kind of device in favour of two-way open channel methods. Although it is possible to achieve better quality speech with one-way devices, we feel that two-way speech leads to better teaching and learning, since the absence of buttons makes the equipment less obtrusive. A certain boldness is required to press a button to interrupt the tutor in full flight, whereas a clearing of the throat may be enough in an open channel.

The alternative to the loudspeaking device is a group terminal based on headsets which would allow a group of students at any one location to participate in a telephone call. The obvious advantages of headsets are that they overcome the howl problem and that volume can be adjusted to taste. It is known that there is some resistance to headsets in a meeting situation, but we feel that our students may be more amenable. The Post Office is presently installing such a device in a Study Centre for a trial period.

Conferencing with loudspeaking and other devices

The reason for using loudspeaking or headset units is to enable a distant person usually a tutor, to speak to a group. But we often want to link in other students as well, be they disabled students at home, or a group of students on a similar unit at another Study Centre or at a students' home. For the single line call up there are no problems and we have conducted many tutorials in this way. But for multipoint work we have to move into the conference mode.

It is well known that conferencing with loudspeaking equipment presents some difficulty. There is a degree of conflict with speech switching at the terminals which is further hampered by loss of volume. Post Office officials generally assert that their LST 4 in particular ought not to be used in the conference mode for these reasons. While there is something in this, we have nevertheless conferenced with several LST 4s on the public switched network and found this feasible if sometimes rather trying. It may be that there will be some overall improvement in this technique when the University goes on to private wires in April 1976. We shall then have LST 4s in our 13 Regional Offices and at the headquarters at Milton Keynes, linked by private wires. But this system will be used mainly for meetings, not teaching.

We have held many tutorials in the conference mode and we have observed that the strictures of psychologists about the inadequacy of telephone conferencing for 'affective' communication or 'bargaining' are not entirely justified. It is true that conflicts are better resolved in the face to face mode since this allows for the full play of human resources such as charisma, visual signs of all kinds and so on. But good and fair chairmanship and a reasonable degree of cooperation and tolerance enables the resolution of quite sharp differences to take place on the telephone. It is essential, however, that the convenor or tutor be able to state the issues clearly and that the outcome of a discussion is summed up properly. This means 'going round the table' in the usual telephone conference procedure ensuring that everyone has been involved.

To return to the student scatter problem in the Open University we find that the conferencing solutions offered bring us into the same area of enquiry being pursued by our colleagues in industry and elsewhere. Any organisation which wishes to link up telephonically a number of locations with several people at each station has the same problem as the OU.

One of the answers proposed by the Post Office is regionally controlled Omnibus circuits (of the party-line type) which would be available to us for several hours an evening for as many evenings a week as we might require. These circuits would enable us to link up a series of loudspeaking devices at Study Centres enabling us to 'spread' a single tutor, possibly located at the Regional Headquarters, to cover, say, twenty students located at ten Study Centres. The circuit becomes active at a particular time and any or all the stations can join in as required and this makes multipoint teaching perfectly feasible with the added advantage of several persons at each station. We have placed orders for these circuits in a number of regions and await the outcome with interest.

User-controlled conferencing on the public switched network

I stressed the need for flexibility in adult education and this characteristic is lacking in a private wires system. Private wires are meant for high usage between fixed points. But what about less frequently used stations like our students at home for instance? At present, only the Faraday facility is able to conference on the public network and the Open University has set out to persuade the Post Office to develop a new facility for user controlled conferencing on the public network. This should give us the flexibility we need for our tutorial programme. The move from the Post Office controlled conferencing on the public network to user control has two aspects. First, it means that participants in a conference can change their location at short notice without fear of missing the meeting. Second, it brings us closer to the point where users become independent of Post Office operators, a condition desired by both parties.

There is one final facility we would like to see developed and that is the 'mixing' of the public and private networks. We would like to be able to introduce a disabled, housebound student into an omnibus circuit tutorial, or an expert not normally attached to the University into a committee meeting being held on our private wire system. This kind of 'mixing' is possible in some countries and we would like to see this facility introduced in the U.K. too.

Conclusion

Technological advance does not always occur to order. Sometimes millions of pounds are spent on research with small return. At other times a good idea fails to find fertile soil and is neglected. There is a growing feeling that telephone conferencing is the right answer to numerous current communication and the location problems not only in the Open University but for many other organisations as well.

While the use of telephone networks for university extension work is spreading in the United States, apart from the Open University this method has not yet been used in Britain. Now that the possibilities are being revealed and the remaining technical problems overcome, this new resource may soon be available to a wide range of educational institutions.

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THE OPEN UNIVERSITY'S EDUCATIONAL SYSTEM

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In this short paper I want briefly to describe the overall teaching strategy of the Open University in order to show what part the telephone plays today, or could play in the future.

The Open University is a system of higher education leading to the award of degrees designed for the home-based learner. Most of the educational material is conveyed to the students in the form of printed texts which are usually highly structured for quite specific educational reasons. These printed texts are supported by the use of television programmes, radio programmes, audio tapes and discs, radio-vision and audio-vision (i.e. the use of printed illustrations accompanied by radio or audio commentaries and explanations), assignments, home kits, tutorials, counselling sessions and the use of computer terminals in one of the 250 odd study centres distributed throughout the United Kingdom. In addition some courses include a one-week residential summer school at a conventional university. All these communication techniques used by the Open University replace the normal face-to-face situation of the conventional universities - the lecture, the tutorial, the seminar and the laboratory. In the Open University tutorial or face-to-face teaching is severely limited and so the various aspects of its teaching role have to be handled in other ways, and one of the University's main tasks is to ensure that each communication channel is used to its best advantage.

The honours degrees which the University offers are modular in character, being awarded on the successful completion of sufficient courses to obtain 8 credits. Some courses involve 32 consecutive weeks of work and lead to a full credit. Half-credit courses also occupy 32 weeks but go at half the pace; that is, one week's work each fortnight. Thus a degree is made up of between 8 and 16 courses depending on the mix of full credit and half credit courses.

One week's work is intended to occupy a student for about 10 to 12 hours. It involves primarily studying one unit of correspondence text - a carefully written and structured booklet of teaching material. Associated with this unit of correspondence text, or with pairs of units, there is normally supporting material in the form of TV programmes, and radio programmes, (each themselves supported by programme notes). Radio programmes often take the form of radio-vision and may be supplemented by means of tapes or discs for repeated use by the student at home. These instructional components of the courses include as much student activity as possible and are augmented by further kinds of activities. The texts contain many self-assessment questions, as do some of the programmes. In addition students have to complete assignments which may be either tutor marked or computer marked: they may be required to work with home kits sent to them, which range in nature from, say, a chemistry set to a small digital computer, depending on the course. They may be required to use a computer terminal. They may have to carry out small projects.

All the foregoing components can, in principle, take place without the involvement of a tutor, and may be regarded as the forward path of the communication process which is teaching. Every effort is made to make the various components of this forward path as appropriate to the variety of students we have (about 50,000 in all), as well as to the channel it occupies, but inevitably some students encounter difficulties. This is where remedial or feedback activities come into play which are sensitive to individual needs. These include written comments by the tutors on the assignments sent them by the students as well as counselling and tutoring sessions when students and tutors meet. The Open University employs about 7000 part time tutors and tutor-counsellors. These meetings occur either on weekday evenings or on Saturdays, but, though they may occur once every two weeks in first year courses they are available only once a month, or worse, at higher level courses. Some courses with small student numbers have to put up with virtually no tutorial sessions. The evening sessions take place in study centres - where also TV, radio sets and computer terminals are available. The Saturday schools, which cannot take place more than about three times per year per course, may be held in colleges with laboratories and other facilities. Summer Schools provide an intensive and important opportunity for both practical work (e.g. laboratories) as well as tutorials, but they last only one week per course and not every course includes one.

These remedial activities are thus very limited. The evening sessions particularly, but the Saturday schools too, may involve students (and tutors) in a good deal of difficult and expensive travel. (Summer school travel is inevitable but is normally reimbursed) It is here that the telephone has a most important part to play. It can, of course, be used to link a student with his tutor or counsellor, it can be used, through teleconferencing, to link several students together either with or without a tutor. It can be used to convey other kinds of data from tutors to students and vice versa, or as a means of accessing information from the University by either students or tutors, or vice versa. It can be used to link groups of students in different study centres together and to enable them to talk with a remote tutor. The organisational and practical factors involved in using the telephone, as well as the technological possibilities for further development in this area form the subject matter of subsequent presentations to this conference by the Open University.

TELEFUN AT THE UNIVERSITE DU QUEBEC: (1) TELECONFERENCING

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ABSTRACT

Teleconferencing has become an activity of increasing importance at the Université du Québec in the last four years. This paper describes, from both technical and organizational points of view, the development of the system and summarizes the results of studies on its use. The system has attained a high degree of user acceptance which provides a realistic basis for the future developments which are discussed.

INTRODUCTION

Created only in 1969, the Université du Québec is the first public university in the province. By 1974/75 its student body had grown to 30,000 and its ten distinct institutions made up a network some 1300 Km long covering most of the populated areas of Quebec. As well as the general campuses at Montreal, Trois-Rivières, Chicoutimi, Hull, Rimouski and Rouyn the network includes two research institutes, two professional schools and the distant study 'Télé-université'.

In order to maintain organic links between the different members of the network plans were laid in 1970 for a communications system calling for the progressive fusion, into a single integrated network, of the university's library, audio-visual, data-processing and telecommunications facilities. A first step was the establishment of versatile telecommunications networks for the transmission, at appropriate speeds, of the voice, data, and facsimile communications necessary to the university's activity.

The voice frequency network consists essentially of direct dial tie trunks linking the internal telephone networks of the various campuses. A special switchboard allows the telephonist to see which tie trunks are in use and to access them manually on demand.

DEVELOPMENT OF THE TELECONFERENCING SYSTEM

No precise date can be given for the introduction of teleconferencing in the University although in 1970 attempts were already being made to hold some administrative meetings by telephone. For these experiments the loudspeaking "Speakerphone" telephone set was used and the necessary connections were made by the Bell Canada operator. This arrangement revealed two major snags.

Firstly, the 'Speakerphone" proved inadequate for groups since the microphone was insufficiently sensitive and the speaker volume too low.

Secondly, use of the Bell Canada operator implied that the lines used for telephone meetings were billed at long distance rates. This extra cost seemed difficult to justify when the University already rented a network of tie trunks.

To overcome the inadequacy of the "Speakerphone" the University persuaded Bell Canada to import and make available the Western Electric 50A conference set. The University is currently renting some twenty of these portable (8 Kg) sets which include a control unit and two plug-in omnidirectional microphones in a convenient carrying case.

The organizational problems were solved after a series of meetings between J.O. Fortier, the University's telecommunications' coordinator, and Bell Canada representatives which resulted in the installation of a special conferencing assembly on the University's main switchboard. This assembly, which is operated by the telephonist, controls a four wire conference circuit that can bridge up to seven lines with amplification in all directions. From the operations point of view the assembly is a call director terminating seven centrex lines and for each line button there is an associated blue conference button. The telephonist establishes the calls by dialing the appropriate stations on regular centrex lines, then she simply pushes the associated non-locking blue button once to bridge the line to the conference circuit. Any party can be isolated from the conference circuit by pushing the same button again. This means that the operator can add and subtract parties at any time and constitutes a useful facility if technical problems occur on one of the lines.

Provided the system is not in use a teleconference can be in progress less than 15 minutes after the organiser notifies the telephonist of his requirements, obviously a most useful characteristic in times of urgency.

With the installation of this system the majority of technical problems (e.g. loss of participants during meetings) were eliminated and teleconferencing became a routine tool. Our records, which only show teleconferences involving at least three stations, reveal regular system use since 1973. In the last two years some 25 university committees, involving about 150 different people have used the system as have many informal working groups. Table 1 summarizes statistics of system use.

Table 1

	1972/73	1973/74	1974/75	1975/76
Average number of teleconferences per month	13	16.3	15	16
Average duration of teleconference	1h11	1h23	1h22	1h11
Average number of stations per teleconference	4.4	4	3.8	3.6
Average number of participants	6.5	6.4	7.3	5.7
Average number of participants per station	1.5	1.6	1.9	1.6

At the present time the average cost (rental of lines and all equipment) of a one hour teleconference linking the seven principal cities of the network is $93.76. This should be compared to the direct travel expenses of over $400 involved in holding a face to face meeting with the same people.

ADMINISTRATIVE TELECONFERENCING

Since there are still surprisingly few teleconferencing systems operating on a routine basis with large numbers of users, the Université du Québec system has been reported on in several studies. In 1973 Short[1], of the London University Communications Study Group, conducted a series of interviews with users and identified four types of teleconference meetings:

(a) urgent meetings caused by crises

(b) meetings related to regular face to face meetings (e.g. to draw up agenda)

(c) regular meetings

(d) additional consultative meetings.

Although the system had only been in use for a year when Short reported, he noted that whereas meetings of types (a) and (b) had predominated at the outset, the proportion of type (c) and (d) meetings was increasing regularly. However, he warned against overdoing the search for similarities between teleconferences and face-to-face meetings, observing that the teleconference tends to generate a style of its own. A more detailed survey by Barrette et al[2] in 1974 provided support for this thesis. Dividing administrative teleconferences into 'telemeetings' and 'telework' they showed that whereas telemeetings were a majority during the first twenty months of system use, telework had attained equal importance by the end of this period.

There is a consensus amongst Université du Québec users that, compared to face to face meetings, teleconferences are shorter, more formal, more tiring and more businesslike. The chairman directs the discussion and usually goes 'round the table' inviting comments on each point. Each participant expresses his views succinctly and digressions or sub-group conversations are infrequent. Only rarely do two persons attempt to speak simultaneously even though the lack of visual cues makes for shorter pauses between speakers.

Short[1] formulated the hypothesis that the teleconference mode increases the power of the chairman but the Barrette et al.[2] study does not support this generalisation. Although 36% of their sample (N = 187) agreed with the statement, 43% disagreed. It should also be noted that the habit of calling for comments 'round the table' by name, which is a frequent feature of teleconferencing, provides an element of democracy not always present in face to face gatherings.

Over 90% of users believe that the teleconferencing system does reduce travelling, 75% consider that it promotes wider consultation prior to decision-making, and 66% find that it enables decisions to be reached more rapidly.

A later study by Thomas and Williams[3] asked users to indicate which type of group work was best suited to teleconferencing. Most frequently cited were problem-solving, crisis decision-making and information swapping. Conversely negociating and making preliminary contacts were activities considered ill suited to teleconferencing.

DIFFERENT SYSTEMS COMPARED

An objective of the Thomas and Williams[3] study was to compare the Université du Québec system with three others, namely the Bell Canada[4] and British Post Office systems (which include a video link) and the voice-only "Remote Meeting Table"[5].

Generally speaking user attitudes to the suitability of their teleconferencing system for different types of work were remarkably similar although Université du Québec users were slightly more extreme (i.e. more favorable for suitable tasks and less favorable for unsuitable ones). However other aspects of the investigation revealed three interesting differences in user attitudes.

1) Université du Québec users compare their system increasingly favorably with face-to-face the more they use it whereas with the Bell Canada system satisfaction decreases with use.

2) Bell Canada users could more easily identify other speakers and were less reticent about discussing confidential matters than Université du Québec users.

3) Université du Québec users associate urgent decision-making with teleconferencing much more closely than users of other systems. Thomas and Williams suggest this difference is related to the greater accessibility of the UQ system.

FUTURE DEVELOPMENTS

Many would like to see a more intensive use of teleconferencing within the university and suggest that the system should be more widely publicised. However it is important that the facilities keep pace with demand for, as Thomas and Williams point out, one of the advantages of the present system is its high availability. Teleconferences can be set up at short notice and two thirds of the participants surveyed can reach a suitable teleconferencing room in less than five minutes.

The present teleconferencing assembly permits only one conference at a time but electronic bridging consoles are now available which allow several meetings to be held simultaneously. Such equipment will probably one day be installed at several campuses although it will be important to increase the number of conference sets and tie-trunks at a similar rate.

An examination of how the present system could be improved, rather than simply extended, reveals three areas worthy of attention, accessibility, visuals and signal quality.

Accessibility Accessibility means two things, a bridging console that is available at short notice and conference sets conveniently located for all participants. Although for short teleconferences between a small number of participants the use of the regular office handset is possible and usual, longer meetings and larger groups imply special station equipment. Since it is clearly uneconomic to place such equipment in every office, its use will reduce the accessibility of the system.

Such reasoning leads to a useful distinction between light and heavy teleconferences. In light teleconferences the emphasis is on accessibility and technical simplicity. Simple terminals such as the regular handset or, better, sets such as the Companion 2 are employed so that no participant need move far from his office. This type of application will develop as electronic bridging consoles which permit several teleconferences to be held simultaneously become available.

However there will often be a need for a heavier type of teleconference involving more sophisticated and varied equipment in a specially designed studio room. One could imagine one, or at most a few, such rooms per campus, each having quality acoustics and station equipment such as the new BNR Daisy set or the Darome Edu-Com which could be equipped with speaker identification lights. They would also contain devices such as facsimile transmitters, slow scan TV, computer terminals and other information display systems so as to create a rich and versatile communications environment.

One can readily imagine teleconference organizers choosing between the light and the heavy mode on the basis of the needs and aims of each meeting.

Visuals All meetings include considerable non-verbal communication which is lost on a purely audio system. At present we are working on the following improvements in the area of visual communication.

1) An indicator light to show participants in which city the speaker is located.

2) An button activated indicator light by which a participant can inform everyone of his wish to speak.

3) A similar indicator which the chairman can invite a participant to speak.

4) Means to transmit copies of texts, graphs, tables etc. to all participants rapidly.

5) Means of commenting on a graph or drawing so as to be understood by all.

6) Means of showing participants' faces, etc.

The first three items on this list will be available in the 'city indicator' that Bell Canada is building for us and which will accept up to eight stations. Item four is partially achieved with the facsimile transmitters presently available at each campus and we encourage their spread within the campuses. For points five and six slow scan TV appears a most useful development. However, it must be remembered that whereas the city indicator system rides piggyback on the teleconference voice lines, both slow scan and facsimile transmission require, if speech is to continue meanwhile, that a second teleconference be set up in parallel for the exchange of visuals.

Signal quality The most important constraints associated with normal two wire telephone lines are the bandwidth and the "one way at a time" limitation. Most loudspeaking telephone sets such as the 50A, the companion 2 and the Daisy improve signal quality with a voice activitated switch which opens and closes the circuits. However this voice switch sometimes produces an irritating "clipping" phenomenon which interferes with communication.

This need for voice switching can be eliminated by the use of four wire circuits but this is only feasible in a dedicated network. Such a network might be worthwhile for the purpose of heavy teleconferences but the international switched telephone network obviously has key advantages of flexibility, accessibility and low cost for light teleconferencing.

VIDEO TELECONFERENCES

The University has had some experience with video teleconferences on an experimental basis. These experiments have involved satellite rather than terrestrial facilities. Thus the University was involved in the Quebec Department of Communications' Comminsat-Frabec programme which included a bidirectional video link between Montréal, Québec and Paris, and is now a major experimenter on the Canada/US Communications Technology Satellite (CTS).

TEACHING BY TELEPHONE

Teaching applications of teleconferencing have been of minor importance to date although some graduate engineering courses were taught for several semesters using a combination of 50A sets and electrowriters and some undergraduates arts courses used audio-only teleconferences in the remote north west region of the province. However, in recent months the Télé-université, which has encountered a student scatter problem, has begun to use teleconferences to link students in their homes much in the manner of the Open University[6]. This branch of the University also makes heavy use of phone lines in teaching computing at a distance, an application which is the subject of another paper at this conference[7].

CONCLUSIONS

Routinely used teleconferencing systems such as that at the Université du Québec are still fairly rare. The success of this system can be attributed to the following factors:

- the gradual evolution of the system in response to needs
- the installation of conference bridging equipment on university premises
- the use of conference sets
- the use of tie trunks where possible.

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TELEFUN AT THE UNIVERSITE DU QUEBEC: (3) LA TELEGESTION AU NORD-OUEST

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ABSTRACT

Teleconferencing is an important feature in the DEUOQ area. This paper describes the development of administrative and educational teleconferencing in North Western Quebec and summarizes the results of a study held in Rouyn-Noranda, confirming some prior results.

INTRODUCTION

Located in the North Western part of Quebec, Rouyn is the center of the smallest campus of the Université du Québec, in regard to the number of students. On the other hand, the DEUOQ is located on the widest campus, covering a surface of more than 300,000 square kilometres; from Rouyn some teachers have to travel as far as 500 km away, and this, every week. Therefore it is superfluous to describe in details the problems involved: loss of time, increasing cost of travel, additional energy required for teachers and administrators.

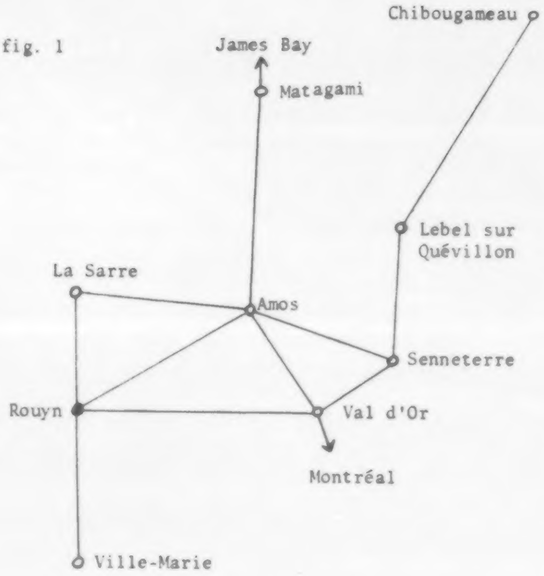
In that situation, it is easy to understand the importance of a good communication link. This is why the DEUOQ became rapidly a regular customer of the University's system, so that it now possesses almost fifty per cent of the 50A available in the Université du Québec (for a description of the 50A, see Daniel and Bertrand or Barrette et al[2]).

ADMINISTRATIVE TELECONFERENCING

In the beginning the DEUOQ was using the Université du Québec system with the switchboard in Québec. Very soon the DEUOQ in Rouyn was equiped with its own switchboard fitted to link five different places at the same time. The system was used more frequently by top managers than by teachers or professionals. The involvement in teleconferencing was considerable (in 1974-75, 52 conferences, with 399 participants).

The distance being a problem not only for the DEUOQ, Mr. P.H. Simard decided to inform the public and parapublic institutions that the system could be available to them, provided they share their part of the costs. After a cost-analysis implying 18 institutions (Simard[3]), a fast, flexible and economic system was proposed to them. The task of coordinating the project was taken by Jean-Pierre Marquis.

fig. 1



THE TELECONFERENCING NETWORK IN NORTHWESTERN QUEBEC

The project was a failure: on the 18 institutions approached, three used the system once in a while, in spite of numerous efforts to publicize it. It is of great interest to analyse the reasons involved, because they are not attitudes expressed on a scale in a laboratory; they are rather behaviors in a real setting, showed by public managers in front of a new technological mean. The hesitations expressed were as followed:

- A feeling that the system is too impersonal to be used for decision-making.
- A need to see people face to face.
- Some fear in face of a new technology and a possible intimidating effect on the part of the subscriber.
- An insufficient number of places where a 50A could be plugged.

- Some apprehension in face of possible technical difficulties; the region not being served by Bell Canada, the telephone communications lack of ten for quality in the signals.

- The public managers were not informed soon enough of the legality of the decisions taken by telephone.

In spite of the problem, the teleconferencing experience of the DEUOQ is a success. The involvement is growing fast.

TEACHING BY TELEPHONE

Three art courses were taught using 50A sets to link instructors located at Rouyn-Noranda to classes totalling about 30 students spread around five towns in western Quebec. One course was totally instructed by telephone, some were instructed in alternance with telephone and face to face communication increased with a tape recorder. A brief evaluation of the courses tells us that sometimes communication links were not very good, marketing studies were not made, so few students responded, compared to what was expected, and the students felt they needed the presence of an instructor.

Other courses were recorded on tapes (audio-transmission) and magnetoscope (audio-visual transmission), and presented to the students by a teacher. When asked, the students expressed the following comments:

- They preferred audio-visual channel with which they were more attentive, concentrated, receptive.

- They felt the presence of a chairman (the teacher) was necessary.

- The courses were more varied and attractive than only face to face.

New projects should bring again some feedback on telephone teaching and mediated courses in Northwestern Quebec, particularly with CTS project.

CTS PROJECT

DEUOQ is the biggest user of Communication Technology Satellite, in the Université du Québec. Five antennas will be placed in the North-west, Hull being linked to Shirley Bay (ten metres antenna) with micro-waves. The time of utilization will exceed 35 hours on a 4½ hours a day, 3 or 4 days a week basis. Some links will be bidirectionnal audio-visual, some will be audio-visual in one direction with audio-feed back, some will be audio in both directions.

The project includes administrative teleconferencing and teleteaching, the latter taking most of the time allowed.

An interesting feature is the fact that communication signals should have a better quality with the satellite than with telephone lines. For the first time there will be an audio-visual link between some points in the North-west. The project could be a preliminary essay of a more durable augmented communication system in the region.

Attitude and behavior in teleconference.

A laboratory research was conducted on teleconferencing behavior. The subjects were asked to discuss on a general topic, and try to take a decision. Three conditions prevailed, face-to-face (six subjects around a table), symmetric-audio (three subjects linked to three others with the 50A set), asymmetric-audio (one subject linked to five others). An analysis of the behavior of subjects gave us the following results:

- There were more interferences in the face-to-face condition.

- In audio-conditions, the interventions were centered on the procedure, more than in face-to-face condition.

- In the face-to-face condition, almost all the interactions were centered on the content of the discussion.

- The interventions were longer in the face-to-face conditions than in audio-conditions.

- In audio-conditions, manipulators of the 50A spoke more often than non-manipulators.

- In the asymmetric audio-condition, most speeches were directed toward the person that was alone.

- Also the subject told that a video link would not have been necessary for their discussion.

When asked on rating their appreciations of procedure, content of the discussion and atmosphere, the subjects gave the following results:

- Procedure, content and atmosphere are more appreciated in the face-to-face condition, and least appreciated in the asymmetric audio-condition.

- In asymmetric audio-condition, procedure, content and atmosphere are less appreciated by non-manipulators of the 50A. The person alone appreciated them the most.

- In the symmetric audio condition, manipulators appreciated more of the atmosphere and less atmosphere than non-manipulators.

We also asked the subjects when they felt the group started to function efficiently.

- The group in the face-to-face condition seemed to function efficiently faster than the group in teleconferencing condition.

- In the symmetric teleconferencing condition, manipilators of the 50A set felt the group started sooner, compared to the non-manipulators.

- In the asymmetric teleconferencing condition, the manipulators placed in groups of five, felt the group began to function well later. We can explain this, by the fact that they found difficult to assume alone the link between the two parties.

Future research should concentrate on video conferencing. It is mostly important to assess the increase of efficiency with the visual link, as we have to consider the high cost od such a system.

Another interesting area of research concerns authority relations in different communication conditions. If a task of laboratory experiments is to approximate reality as precisely as possible, that type of manipulation should give very interesting results.

Also, studies of perceptions of the interlocutors' cognitive dispositions. Most of the studies were conducted on the perception of affects (friendliness, cooperativeness, warmth,...). But the lack of cues changes also the perception of others' ideas. It would be interesting to compare self-ratings and ratings of others, on a topic, after a discussion implying different links of communication.

Finally, as laboratory studies can never reproduce the real context of teleconferencing (decisions with less important consequences, lack of experience with the medium, possible awareness that the study is on the medium, rather than on the discussion content, ...), it should be important to analyse transcripts of real conferences under normal conditions to assess a certain style of discussion. Some characteristics could be brought into light, and compared with laboratory experiments.

CONCLUSION

Teleconferencing and teleteaching are essential in Northwestern Quebec, for the development of a "regional spirit". The Université du Québec system should make possible for everyone in the North-west to have access to education without having to move or always be on the road. First developments is to give us some indications on the utilization of the system, the problems in publicizing it, and the behavior of teleconferees. Future developments should be oriented toward extensive research on education applications, and for that, the CTS project would be a precious help, and a good start toward something permanent, used often by more people.

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TELETUTORING IN DISTANCE EDUCATION

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Since July 1973 there is a research project going on at the Department of Education at the University of Lund in Sweden. The research project is given financial support by the Bank of Sweden Tercentenary Fund and is being carried out in co-operation with the European Home Study Council (CHSC). The collection of data is still running and will be finished in 1976.

The main aim of the project is to study the importance of two-way communication in distance education and how this two-way communication can be reinforced. The students taking part in distance education are studying by means of correspondence instruction at a number of European correspondence schools. In order to shed some light on different ways to establish two-way communication the research work is based on three experimental series.

Postal two-way communication

In the experimental series 1 we are studying the structure of postal two-way communication. We know from a survey which has been carried out within the project on behalf of the Swedish Ministry of Education that almost every distance education system in the world is based on printed material, in most cases on a correspondence material. One of the most essential characteristics of a correspondence course is the written correspondence - assignments for submission - between the tutor and the student. We also found that these assignments for submission are of varying importance in different parts of the world. In Soviet Union and GDR for instance they play a less important role, while in the Western world we as a rule attach greater importance to the assignments for submission.

In the series there were some questions we wanted to examine. How important is the postal two-way communication really? How does it matter if we increase or reduce the number of submission occations? Does the types of assignments - objective type or essay type - make any difference?

Correspondence education combined with group meetings

Another experimental series (in the project labelled as number 3) concerns the problem of whether it is possible to reinforce the correspondence studies by giving the students a chance to meet study-fellows and tutors. This combination of self-studies with the help of correspondence material and group-meetings is common all over the world, but seems to have the greatest importance in socialistic countries. In certain reports the opinion has been put forward that one of the most negative elements in correspondence studies is that the students feel socially isolated because they are working alone in their homes. If this is true - we cannot be sure that it is - it would be of great help for the students to break that social isolation by participating in group activities.

We posed a great number of questions in this series. It is necessary to have a trained, skilled teacher as a leader of these meetings? If we work with a skilled teacher, which role should he play? Should he be an available resource or should he conduct the activity? What is most essential to the students - to establish contact with the teacher or to establish contact with other students?

Systematic telephone instruction

The last experimental series (in the project labelled as number 2) concerns the possibility to reinforce postal two-way communication with the aid of tele-communication. Also in this series we are interested in studying in which way the predicted social isolation can be treated. But the main purpose is to study if it is possible by supplementing the assignments for submission with a telephone call from the tutor at the school, on one hand to improve the achievements of the students, and on the other hand to improve the motivation of the students and in this way reduce the total time of study.

In the experiment carried out in this series we decided that the tutor should call the student systematically. The students are studying by correspondence and when they receive the corrected assignments from the school, the tutor calls them. The assignments are the basis for the telephone call and the conversation starts from them. But there are no restrictions introduced. The tutor and the student can talk about anything.

All telephone calls are recorded for further analysis. This analysis will be a kind of content analysis to find out what the tutor and the student are discussing. If the distance learner has a feeling of isolation when studying, maybe we can in the analysis of the calls find some confirmation of this supposition. A pilot study has been carried out to test the method of calling and the analysis of content.

The telephone used in educational contexts

The telephone can be an excellent aid in distance education. It has been used in different way. We have in our research project made a survey of the literature concerning the use of the telephone in educational contexts and come to the conclusion that the telephone has been utilized in mainly 4 different ways:

(1) Teleteaching is operating by means of a two-way transmitter (telephone) placed in a classroom. It enables a sick or handicapped student to keep up with his class work without being physically present in the classroom. The student can at home hear all that is going on in the classroom, and he can indicate by means of a signal when he wants to speak and answer questions. When he speaks everyone in the classroom is able to hear what he ways, as if he were present.

(2) Telelecture also operates by means of a two-way transmitter: A teacher can through the

use of the telephone - located anywhere in the country - give a lecture - simultaneously - to one or several groups of students located in different places. The teacher's voice is amplified in the classroom, and the students can communicate with the teacher through a series of microphones connected to the telephone line.

(3) Dial-access is an information service system that provide a person with brief summaries on different topics. The summaries are recorded on tape and become available by dialing an operator who switches the call to a playback machine and inserts the tape cartridge requested. Most dial-access systems operate in connection with libraries.

(4) Teletutoring enables a student by means of a telephone to get in touch with his tutor to have individual support in his study work. The student is studying independently with the help of preproduced study material such as a correspondence course. The tutor then calls the student - or the student calls the tutor - and they discuss the work. This two-way communication is always between one student and one tutor.

According to these four ways of using the telephone the two first mentioned forms - teleteaching and telelecturing - imply that one part of the at least two connected is a group. That means that those forms are rather inapplicable for correspondence institutions. Primarily they are rather uneconomical. On the other hand they can be used, teleteaching first of all as aid for handicapped students, telelecturing especially as tele-conferencing within greater multimedia solutions of distance education.

The third form - dial-access - has been used in distance education mainly without any connection with correspondence material. It has been used as a service to specific occupational groups but also in conventional schools.

The last mentioned of the four forms - teletutoring - we think can be of the greatest interest for correspondence schools. This method we are using in our experimental series. It has already been used in connection with correspondence courses. The German multi-media project TELEKOLLEG allowed their students to call and ask questions to their teachers at certain times. Chicago TV College has a teacher available a couple of hours a week by telephone. The students can call and ask questions. The answers will be given promptly.

A pilot study

At the Department of Education at University of Lund where we are working with the research project in 1973 there was arranged a course of Educational Technology at distance. Our research team had the opportunity to follow this work very closely and to perform some evaluative studies concerning the use of the telephone.

The course was scheduled as a correspondence course with four week-end meetings during the seven months the course lasted. Between the meetings the teachers were in contact with the students by telephone. All telephone calls inter-changed between tutor and students were recorded. To record the calls a recording machine was set up. It was a cassette tape recorder (Philips 2002) connected to the telephone. To enable the students to call the tutor to discuss or to get assistance in any way, an automatic answering machine (Telefunken 105) was connected to the recording machine. In this way it was possible for the students to call the machine any time of the day and deliver a message to the tutor. The running time of the answering machine was 90 sec. Every day the machine was tapped and the tutor then called the student to discuss a problem stated by the student.

The students had a very positive attitude to the use of the telephone. The fact that the calls were recorded did not affect them in a negative way. They knew about the recordings. Totally 140 calls were exchanged and recorded by the 19 students. That means an average of 7.37 calls per student. The average length of duration was 7.81 minutes, but the variation was relatively great, from 1 min 19 sec up to 25 min.

The recorded calls was subjected to content-analysis. Each call was divided into three equal parts and the content of each of these parts was categorized according to a schedule of categories. Two categories were dominating. First of all it concerned problems of subject-matter nature actualized by the tutor, and secondly, practical, organizational and administrative problems actualized by the student. Also social-personal problems actualized by the students were discussed, but less than expected. However, the pilot study gave us some knowledge about the possibility to analyze the content of a telephone calls which will be useful when we are presenting the results from the main study.

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EDUCATIONAL TELEPHONE NETWORK

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The establishment of the Educational Telephone in local County Extension Offices without preconceived planning can lead to "CHAOS" in capital letters. This best describes the situation that prevailed when the Educational Telephone Network was first installed in the County Extension Offices throughout the state. We felt that the system provided the county faculty with another tool for educational programming that could be useful, but the beginning years were frustrating.

Our problem began to mount because we had not addressed ourselves to following operational procedures.

1. Scheduling of local room facilities.
2. Who on the County Extension Staff was responsible for programs not associated with the local staffs educational duties.
3. A method of registering the clientele.
4. Publicity and promotion of programs.
5. Availability of Audio Visual Equipment, (slide projectors, overhead projectors, etc.)
6. Individual staff members available to open rooms, set up Audio Visual Equipment and teach clientele how to operate Educational Telephone Network System (ETN).
7. Departments were not allowing enough time between program announcements and programming.

Let me review some of the history surrounding this new communication system to clarify my earlier statements that implied "CHAOS". The Educational Telephone System originally was used by the University of Wisconsin Medical Department for training doctors and medical staff with a special contract and outlet at local hospitals. Therefore, the County Extension Offices located in the same community as a hospital were given the service. In our case, the local hospital had the Educational Telephone Network System, which is located across the street from our office; so naturally we had the equipment at an early date in 1966.

Previous to the ETN System, we had installed in our office a SCA Receiver that operated through the State Educational Radio System. Through this system we could receive communication from University of Wisconsin Extension, but did not have two-way communications. When the ETN System was installed it provided us with the two-way communication system.

University Extension is a large organization, with many departments. Primarily, our County Extension Offices were designed for educational programming in Agriculture, Home and Family Living, Youth Development and Community Rural Development. The faculty dispersed throughout the state had programs relating to the College of Agriculture, Home Economics, and Youth Development; which more than filled the ordinary work week for the County Extension Staff.

When the Educational Telephone Network System began to function, it provided a vehicle for every department in University of Wisconsin Extension to begin programming. Of course, the departments were attempting to locate their own clientele group within our respective counties. They began promoting and publizing programs throughout the state without coordinating with the local county staff, who had to provide the facilities for the local clientele to use the system.

Basically, they did not take the time to relate to us on the county level, remember each of the county faculty has program responsibilities and thus their own subject matter expertise. Furthermore, the systems were located in the county owned facilities, and they have rules and regulations, such as hours open, closed on Saturdays, requirements of who can open the building.

But in the meantime, the campus based staff began scheduling programs, sending out literature, registering students and clientele. We on the county level had not coordinated their programs, we did not have a pre-registration list, no arrangement for opening facilities, etc. As the County Office Chairman in Monroe County, and a county faculty member, who has lived in the county for over 20 years, people know who you are and how to reach you. Many times people called from the Courthouse to find out why no one was present to open the room or set up the equipment. This usually happened about the time I was sitting with my family at the evening meal. Or I would have left for a meeting somewhere in the county and not at home. Therefore, my wife had to handle the harassment over the telephone from our clientele. Needless to say this type of arrangement did not improve the image of the local County Extension Office, especially under our Wisconsin idea, the boundary of the campus is the boundaries of the state. Plus it didn't help my blood pressure or my disposition.

Furthermore, the production of programs were not so great. When an instructor attempts to discuss or teach a subject in a monotone over a telephone system without visuals or outlines you don't turn on the student.

Under the above described condition, it's a wonder we had any audience or clientele group to reach. After a few exasperating months of this type of operation, I'm happy to say the situation began to improve. In the academic world, committees are established as a method of improving the situation.

The campus based faculty knew they had some problems, so they got together to clarify the situation without county based faculty. This prevailed for awhile until the county rabble rousers expressed their thoughts to Administration.

Thus, I was appointed Chairman of a committee to study or maybe passify my fellow county faculty members. A representative of each of the eight Extension Districts in the state were appointed by the District Extension Director to study the issues and make a recommendation to Administration.

The major concerns of the County Extension faculty were studied with the following results:

1. Registration procedures were clarified through the use of the University Wisconsin Extension Computer System and a central registration office for all programs. Enrollees could also register in the local Extension Office as set forth by U.W. Extension rules and regulations for handling funds.
2. A County Extension faculty member was designated by the District Extension Director to serve as Local Program Coordinator.
3. A para-professional was hired to assist the local staff with operating the ETN System. This system operates from 7:00 A.M. to 10:00 P.M. daily during regular school year and some programs are held on Saturdays. Special funds were made available from U.W. Extension to assist the counties in hiring the para-professionals. Because of budget constraints on the state level it may be necessary to budget locally for this individual.
4. Additional Audio Visual Equipment, slide projectors, and overhead projectors were provided counties to support the ETN programs. Many times the local equipment is being used by the County Extension faculty in their educational programming.
5. U.W. Extension Departments were required to schedule their programs through Instructional Communications 60 to 90 days in advance. This procedure gives the county office an opportunity to accept or reject a specific program because of space limitations.
6. Departments were encouraged to select local conveners from the enrollees, so they could lead any special discussion deemed necessary by departments. The convener would also be responsible for presenting any visual materials required during the presentation.
7. Publicity and promotion of programs through the local news media is handled by Local Program Administrator. Departments send out brochures announcing the program to known selected clientele. Additional brochures are also mailed from the county office when deemed necessary.
8. A set of definitions were prepared to assist in clarifying the system's operation.

This was the first attempt to clarify some of the operations associated with the ETN System. These items were taken into account and coordinated by Lorne Parker, Director of Instrumental Communications. We did detect an improvement in communications between the county staff and campus based faculty.

As the system began to grow and became more sophisticated, a statewide committee was formed by Dean Luke Lamb, composed of campus and county faculty. This Advisory Committee was organized into sub-committees that prepared in depth guidelines in the following areas:

Program Design Program design is basic to presenting a well designed learning situation for specific clientele. This sub-committee suggested that program organization considers six stages of program planning.

1. Description of clientele
2. Clarification of purpose
3. Program format
4. Consideration of specific techniques
5. Planning the preparation schedule
6. Evaluation procedures

When it has been determined that ETN is the most effective vehicle. Responsibility for ETN programming should be carried by experienced faculty members who have worked enough with the target audience to know their interests and modes of responses. Teaching style is important, involving the participant in doing more than listening.

Promotion and Publicty A clear distinction of responsibilities between departments, the Office of Public Information and County Extension Offices was outlined.

1. Instructional Communication System logo was adopted.
2. Standard format for brochures to provide continuity.
3. Press releases are the responsibility of the Office of Public Information in cooperation with programming department and Instructional Communication System.
4. Special press releases prepared that are adaptable for use in specific newsletters and publications.
5. Limited newspaper advertising prepared for publication in regional Sunday newspapers.
6. Preparation of an inexpensive listing of all program offering for a specific semester for statewide distribution through County Extension Offices.
7. Office of Public Information assists departments in preparing feature and human interest stories.

Technical System Recommended establishment of the following types of systems to meet our future needs:

1. General Circuit
2. Credit Course Circuit
3. SEEN Audio Circuit
4. SEEN Electrowriter Circuit
5. SCA Circuit

This is a long range plan that has not been attained at this point in time. This type of network system would give us much more versatility.

New speakers and transmitters were developed to replace our first units and have been installed in County Extension Offices since the committee report was filed.

Learning Centers The committee recommended that 12 learning centers be established in 12 learning districts throughout the state. The learning centers are to be called Instructional Resource Centers. Eventually, a learning center to be established in each county location. This is a long range plan that has not been attained at this time.

Operational Procedures In many respects the operational procedures helps to clarify the use of the entire system and provides for a smooth operation.

1. Local Program Administrators are appointed yearly.
2. Committee strongly recommended that the criteria for program planning guidelines be used by the various departments and enforced by Instructional Communication System.
3. The use of ETN - SEEN should be limited to Extension sponsored programs. It is an effective vehicle for public service, therefore, it should be the responsibility of departments to work in conjunction with outside agencies to perform this mission.
4. All ETN - SEEN listening locations must be under jurisdiction of Extension faculty.
5. A scheduling procedure is recommended that will allow departments to reserve time at least nine months in advance. Scheduling early with County Extension through the Instructional Communication System allows the county to accept or reject certain programs depending upon the demand for their facilities. We strive for a 60-90 days of lead time.

The Monroe County Extension Office has five separate outlets available throughout the Courthouse facilities where ETN programs may be scheduled. To accommodate the scheduling of programs and room location, we have adapted the following procedures that blend with our existing county operations.

1. Program annoucements are received from Instructional Communications 60 or more days prior to the actual program production. The office secretary schedules the program on our office calendar and reserves the necessary space. If there is a conflict, a post card is returned to Instructional Communications rejecting the program.
2. News releases announcing the program, prepared by the Office of Public Information arrive at the local office in our weekly Community Programs newsletter with a program schedule. News releases are reviewed by the local Program Administrator, if they pertain to a specific county faculty member program, the release is referred to them. All other news releases are handled by the local Program Administrator and selected for the various clientele groups within Monroe County. If the audience is small, the releases are sent directly to the individual. In our case, the news releases are sent to 12 different media outlets which include newspapers, shoppers guides, radio and TV stations. We receive excellent cooperation from the local media in providing educational programming information to their audience.
3. A weekly schedule is posted on a bulletin board for all staff personnel to review. A large wall calendar is located in the main ETN location, listing all the programs scheduled for the county Thus, anyone can review the present schedule as well as the advanced schedule.
4. Programs that are presented during the normal office hours are handled by the office secretaries.
5. Programs that are scheduled during the evening hours or on Saturdays are handled by a para-professional. The ETN assistant is present at the first class session to instruct the student in equipment operation, register new enrollees, set up Audio Visual Equipment, and explains the mechanics of opening and closing the room for future sessions. The ETN assistant usually meets with the class at the first two sessions because of budget problems. Thereafter, the enrollees attend the class without further assistance. If audio visual material or other information sent out by the instructor is required for a particular session, the office secretaries place the material in the ETN room for the student.

The afore mentioned procedures have operated fairly consistent over the years, so we feel that the ETN System now serves a useful purpose. Next we need to increase our enrollments, but competition for the students time is critical. Continual growth will be determined by our ability to promote interest in continuing education, type of programs offered and improvements in method of instruction.

The operation and the effective use of the ETN - SEEN Network is dependent upon cooperation. The cooperation must evolve around a continual dialogue between campus based departments and faculty with the County Extension Office faculty. If there is a breakdown in any part of the system, problems begin to multiply. Personal aggressiveness, competition, and attainment for success dictate that my program is the best and should receive the most attention. Remember, it is pretty easy to turn the system off when you are 120 miles from the base.

Thus, we as educators must strive to improve the delivery system through Public Relations, Promotion and excellent programs. The success of the system is dependent upon our ingenuity to convince people that we are offering a reliable product that could meet their needs. Our final product will be judged by how well we have met the needs of the individual or family in our communities.

CHANGING BEHAVIOR VIA ETN PROGRAMMING

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Since the Educational Telephone Network was established 10 years ago, the Department of Continuing Medical Education has devoted a great deal of time and effort attempting to evaluate the medium. At best, the various evaluations based on pre- and post-testing indicated that the medium did not interfere with the educational process.

In late 1974 the department presented a Smoking Modification Clinic over ETN which re-confirmed the prior conclusion. However, most important, for the first time it documented for the department a reported change in behavior as a result of participation in ETN programming.

From May 15 to June 5, 1974, a series of five weekly programs was presented, using an established curriculum which evolved from workshops presented in various locations around the state. The planning was done in cooperation with the Wisconsin Heart Association, Wisconsin Division of the American Cancer Society, Wisconsin Lung Association, and the Division of Health of the Wisconsin Department of Health and Social Services.

The series used an established methodology which had been tested in previous workshops. Each session had its specified goals, both for the formal presentation and the week-long period between sessions.

The primary instructor was recognized as a master teacher in the subject area, having presented workshops in Madison and the surrounding area for several years. He was assisted by volunteers at each of the 33 ETN locations selected for the experimental series.

Consequently, the experiment involved an established curriculum and methodology, presented by an experienced teacher. The only variables in comparing results with those of the workshops was the use of ETN and the lessening of the impact of the master teacher by delegating some of the teaching to relatively untrained volunteers.

The curriculum was as follows: (1) The first week was an introduction to the faculty, class philosophy, course content, and behavioral aspects of smoking. (2) Week two involved a physician discussing the medical aspects of smoking and the difference between habit and addiction. (3) The third session discussed the psychological aspects of smoking, tips on quitting, and the art of listening. (4) The fourth week was a review of session three, presentation by an ex-smoker, and tips for restraining from smoking. (5) The fifth and final session was a total review, tips on concurrent weight control, preparation for final cessation, and discussion of forming alumni groups.

The methodology was also carefully designed. The first hour of each session involved formal presentation of information; the second hour was devoted to "rap" sessions whereby participants could become actively involved in the educational process. Behavior modification was introduced gradually; the first 24-hour withdrawal was introduced at the third session and 48-hour withdrawal at the fifth. At session three each participant selected a partner to be available throughout the remainder of the course and subsequent months to lend moral support as necessary.

Much of the success of both the previous workshops and the ETN series is attributable to the primary instructor, John Marvin of Madison. A former four-pack-a-day smoker, he demonstrates an ability to establish rapport with participants and takes a realistic and supportive approach to their problem.

Evaluation of the ETN series included analysis of registration and attendance, and questionnaires completed by participants before, at the conclusion of, and six months after the programs. Only that data related to reported behavior change will be reported here. Where possible, it will be compared with other methods of accomplishing smoking modification. These are the workshops previously conducted by John Marvin and an experiment on "Termination of Smoking by a Single Treatment", reported by Herbert Speigel, M.D., in the June, 1970 issue of Archives of Environmental Health, which used hypnosis as the methodology.

The first comparison involves efficient use of professional time and effort. In the ETN series, of the 521 who registered, 264 completed the five sessions: there were five hours of Marvin's time and 165 hours of volunteer leader time involved in instruction. For the workshops, average participation was 30, with 10 hours of Marvin's time involved. For the hypnotism session, each patient required 45 minutes of the psychiatrist's time. Table 1 gives presents detailed data:

Table 1

	ETN	Workshops	Hypnosis
No. completing	246	30	615
Professional hours	5	10	461
Hours per Participant	.02	.33	.75
Volunteer hours	165	0	0
Hours per Participant	.67	0	0
Total Hours per Participant	.69	.33	.75

As indicated, the workshops proved most efficient in use of instructor time, and the ETN and hypnosis methodologies are quite comparable. However, when only professional time is considered, the ETN sessions proved substantially more efficient. This appears to be an important factor; the sponsors of the workshops in the Madison area indicate they have been unable to develop a cadre of primary instructors and are totally reliant on Marvin. Equally, those experienced in hypnosis are in short supply, and expensive. The ability to multiply the impact of a master teacher, supplementing his activities with volunteers, appears to be a valuable attribute of the ETN.

Another factor in effectiveness and efficiency involves the percentage of learners who are able to stop smoking as a result of involvement in one of the three methodologies. In all cases, the data deals with reported behaviors, and measurements were taken six months after the sessions. Nonrespondents were assumed to have been unsuccessful. Table 2 gives the results:

Table 2

	ETN	Workshops	Hypnosis
Number who quit	36	16	121
Percent who quit	14.6	53.3	19.7

As indicated, the ETN sessions were least effective; the workshops were substantially more effective. However, there is one variable which must be mentioned. Both the workshops and hypnosis procedures were established methodologies which had been perfected over time and can be considered optimally effective. The ETN sessions, while using the basic workshop methodology, did experiment with volunteer teachers at the local sites. Experience indicated that there could be improvement in both the selection and training procedures for these volunteers, with potential for improved effectiveness.

Relating the effectiveness with the amount of professional time involved also appears relevant. This is done in Table 3:

Table 3

	ETN	Workshops	Hypnosis
Number who quit	36	16	121
Professional hours	5	10	461
Hours per Participant who quit	.14	.62	3.81

As indicated, ETN is significantly more efficient in use of professional time. If professionals capable of bringing about behavior change are in short supply and significant numbers cannot be trained, ETN offers an attractive alternative medium. Further, with agreement that cigarette smoking is a major health problem of epidemic proportion, ETN compares quite favorably as the method to have the quickest impact with the largest number of smokers.

In summary, the project has documented that ETN programming can result in behavior change. When compared with other methods of accomplishing the same change in behavior, it is less effective than the two other available methodologies. However, in terms of efficient use of professional time and in total numbers of participants whose behavior could be changed in a short time span, it has definite advantages. Finally, since it is an evolving methodology, improvement in the methods of selecting and training volunteer instructors might improve its effectiveness and efficiency.

PHARMACY TELELECTURES:
AN ANALYSIS OF EIGHT YEARS' EXPERIENCE IN WISCONSIN

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During the period 1969 through 1973, 43.8 percent of the registered pharmacists in Wisconsin participated in one or more of the continuing education offerings of Extension Services in Pharmacy. The average number of hours these participating pharmacists spent in such activities increased from 3.22 hours in 1969 to 5.56 hours in 1973, an increase of 72.7 percent during the five year period.[1]

This relatively large increase in overall participation can be attributed to the development and growing popularity of the telelecture method utilizing Wisconsin's Educational Telephone Network (ETN) for providing continuing professional education.

The philosophy of Extension Services in Pharmacy is that quality continuing education programming is a necessity if we are going to provide meaningful educational experiences for our students. Interesting and pertinent subject matter is not sufficient. The teacher must be good, and participation for the students must be convenient, relative to their perceived needs, and satisfying to their preconceived notion of what the experience should make available to them. In addition, the organizational structure of courses should be clear, and the statement of goals to be accomplished should be well thought out and clearly stated.

In Wisconsin evidence of participation in continuing education for the relicensure of health professionals has not been enacted by the state legislature, so the effect of such legislation has not yet clouded the available data describing the participation patterns of health professionals in continuing education.

This paper is based on the assumption that our clientele represents a noncaptive audience, and the information and data presented here give a true picture of participation in continuing education activities offered for health professionals by Extension Services in Pharmacy.

The broad objective of continuing education courses for practicing health professionals is to provide learning experiences or activities for them which will increase their worth to their professions and to the society they serve.[2] However, it is not the purpose of this paper to discuss the evaluation of continuing education which is defined as the measurement of change in behavior and judgments in the direction of established goals and objectives. It *is* the purpose of this paper to determine, with the means available at this time, the quality of a specific type of continuing education activity (telelectures) based on such nondidactic considerations as enrollment and attendance patterns of participants.

One of the obvious deterrents to participation in continuing education activities by health professionals is that the offerings are not convenient. In the past, they have been available only at university campuses or metropolitan centers, and getting to the site involved disruption of normal work schedules, wage expense for relief personnel, and travel time and expenses. Various alternatives to alleviate these deterrents to face-to-face continuing education have been developed. These alternatives make use of the electronic mass media and include radio, television, and telephonic communication.[3-6] In Wisconsin telephonic communication or the telelecture has been shown to be an effective and economical method for providing continuing education for health professionals.[7]

The Telelecture Method

The telelecture method of teaching is the use of an amplified telephone call for the disseminating and sharing of information and ideas among groups of individuals assembled at various distant locations. The only equipment necessary, in addition to a regular nondialing telephone handset, is an amplifier or loudspeaker which is installed into the system by the local telephone company. Each such installation is interconnected so that a convener at any location can pick up the handset and speak to all other locations.

The method uses ordinary telephone lines and provides for communication among select and known groups of participants. It takes the form of a huge party line and is designed for maximum flexibility and practical approximation to across-the-table discussion.

Wisconsin's Educational Telephone Network

Utilization of the telelecture method in Wisconsin, on a demonstration basis in the early 1960s, has been documented by Axford and by Cook, but it was not until 1966 that the method was used to provide continuing education on a systematic basis.[8,9]

An experimental series of regularly scheduled medical conferences was conducted during the period November 1965 through February 15, 1966, by Extension's department of Continuing Medical Education. The series of medical conferences, received by a network of 18 hospital locations throughout Wisconsin, was designed to determine the usefulness of the telelecture method as a practical, convenient, and effective form of continuing education for the medical and allied health professions of the state.

The success and acceptance of the experimental series, as later reported by Meyer *et al*., prompted the leasing of a network of private telephone lines on a full-time, academic year basis by the University of Wisconsin for teaching purposes beginning February 15, 1966.[7]

Extension Services in Pharmacy has offered at least one telelecture course each academic year since the network has been in operation, and during 1967-68, two courses were offered. The titles and dates of the six to eight biweekly lectures for each of the courses follow:

Advances in Pharmacology, Spring 1968
Clinical Considerations in Drug Therapy, Fall 1968
Antibiotics Seminar, Fall 1969
Drug Interactions, Fall 1970
Selected Topics in Pharmacology, Fall 1971
Pharmacologic Approaches to Disease States, Fall 1972
A Rational Approach to Drug Selection, Fall 1973
Geriatric Considerations in Drug Therapy, Fall 1974
Pediatric Considerations in Drug Therapy, Fall 1975

The data collected from the Spring 1967 course have been reported by Blockstein and Durant.[10]

Design of Pharmacy Telelectures

As the name implies, the telelecture method utilizes, but is not limited to, the lecture-discussion technique of teaching. The lectures are prepared and taped from several weeks to several months in advance of the actual presentation. This allows sufficient lead time for the preparation and duplication of the handout material which has become an integral part of each course. During the past few courses an average of about 10 pages of such handout material has been provided for each lecture.

The basic subject matter content of the courses was determined from suggestions solicited from the individuals who have taken part in previous courses. These suggestions were refined into topic areas by the departmental staff, and a lecturer was selected who possessed subject matter competency as well as the qualities of a good teacher. It has been found that a single lecturer for a course provides for greater continuity and organization of the subject matter. The decision about the specific content of each individual lecture was left to the lecturer.

This course design embraces the educational attributes of the teaching-learning situation: illustrated lectures by teacher-experts, discussion and question-answer sessions to clarify information given in the lecture, an optional final examination to determine subject matter competency, and recognition in the form of a printed certificate as well as a permanent transcript record. Since this paper does not deal with an evaluation of the courses in terms of cognitive changes in the students, no further mention will be made of the final examination.

This design simulates the typical classroom lecture, with the exception of the absence of the lecturer. However, as mentioned earlier, a convener at each location is responsible for making sure attendance is taken and for adjusting ETN equipment, in addition to serving as the network "voice" for the location.

Very few changes have been made since the original design was inaugurated. Slides were originally used to illustrate the first telelectures, but they have been completely replaced by printed copy distributed to the learners in advance so they can view them during the lecture, make notes on them if they wish, and retain them for future reference. Originally, questions were called for by a roll call of locations. More recently, questions have been asked at random by the locations, thus conserving time for additional questions and discussion.

The format described above has been an efficient and acceptable means for the presentation of courses utilizing the telelecture method for health professionals.

Enrollment in Pharmacy Telelectures

Enrollment for pharmacy telelectures over the past eight years has ranged from 241 to 521 individuals per course with a mean course enrollment of 397. An analysis of the fluctuations in enrollments from course to course are shown in Table I and indicate a mean enrollment increase of about 5 percent over the nine courses considered. The decline in enrollment during the spring and fall of 1968 may indicate that there was a "wearing off" of the novel nature of the telelecture method by those who wanted to see what the new "telephone teaching system" was all about.

Table I Enrollment and Enrollment Increases for Pharmacy Telelectures

Date	Enrollment	Enrollment increase over previous course N	%
Spring 1968	267	-51	-16.0
Fall 1968	241	-26	- 9.7
Fall 1969	328	87	36.1
Fall 1970	415	87	26.5
Fall 1971	394	-21	- 5.1
Fall 1972	426	32	8.1
Fall 1973	521	95	22.3
Fall 1974	495	-26	- 5.0
Fall 1975	490	- 5	- 1.0
Means	397	19	4.8

No explanation is offered for the more than 25 percent increase in enrollment for the 1969 and 1970 telelectures. The drop in enrollment for the 1971 telelecture can probably be attributed to the selection of a poor lecturer for three of the seven lectures during the 1970 course. This cannot be documented but is based on feedback received from the participants in that particular course.

Enrollment increased by 8.1 percent in 1972 and by 22.3 percent in 1973 to an all-time high of 521 students. The slight drops in enrollment in 1974 and in 1975 indicate a normal levelling off at about 500 students.

A mean course enrollment increase of near 5 percent over the past eight years may not appear to be very great, but consider how your money grows when placed in a savings account at 5 percent interest.

Since pharmacy telelectures have been offered for health professionals in general and pharmacists in particular, it was of interest to determine which professional specialties have been represented by the enrollees in the courses.

Professional Specialties of Enrollees

As with all continuing education activities conducted by Extension Services in Pharmacy at the University of Wisconsin, all registered pharmacists in the state are circularized concerning telelecture offerings each year. In addition, each hospital location on the ETN is circularized and asked to notify its professional staff of the courses. For the past five courses, dentists in Madison and Milwaukee metropolitan areas have also been circularized.

Table II shows that the overwhelming majority of telelecture enrollees are pharmacists. This is as expected, since the pharmacy telelectures are designed specifically for pharmacists and since there is a much greater selection of telelecture course offerings for the other health professionals by their respective extension departments.

Table II Professional Specialties of Enrollees in Pharmacy Telelectures

Specialty	Spring 1968	Fall 1968	Fall 1969	Fall 1970	Fall 1971	Fall 1972	Fall 1973	Fall 1974	Fall 1975
Pharmacy									
Community.	191	104	145	180	150	195	209	178	219
Hospital	71	129	165	144	123	133	152	146	170
Other.	3	3	10	38	15	16	17	49	56
Nursing.	1	5	7	22	73	51	81	108	35
Other.	1	0	1	23	31	30	52	12	10
Nonhealth Professionals and Not Ascertained.	0	0	0	8	2	1	10	2	0
Totals	267	241	328	415	394	426	521	495	490

It is interesting to note the relatively large number of hospital pharmacists in comparison to the number of community pharmacists enrolling for the telelectures. When the average of the 1971 and 1972 telelecture enrollment figures for pharmacists is compared to the average NABP Licensure Statistics, Census of Wisconsin pharmacists for those years, it shows that an average of 34.2 percent of the hospital and 9.0 percent of the community pharmacists in Wisconsin enrolled for the courses.[11]

During the period 1973-75 the average enrollment of hospital and community pharmacists in pharmacy telelectures remained essentially the same: 31.7 percent for hospital and 11.7 percent for community.[12]

The increases in the number of nurses enrolling in the telelectures can be attributed both to the increase in circularization of that speciality and to the subject matter content of the courses. A survey of the telelecture course offerings by Extension's Department of Nursing indicate that it is oriented toward the esoteric knowledge of that speciality. Since the combined enrollment figures for the 1970-72 courses indicated that the nurses accounted for about 12 percent of the total enrollment for those years, it is apparent that the subject matter offerings in basic science related to drugs and their use are of interest to a segment of that profession. The average enrollment of nurses during the period 1972-75 increased slightly to 14.9 percent indicating that pharmacy telelectures continue to fulfill a continuing education need for that profession.

Enrollment figures are interesting, but contrary to the philosophy that "success is determined by the number of people who enroll and the volume of funds generated," they do not give any indication of quality. More reliable parameters of quality are individual attendance patterns.

Attendance Patterns

A summary of the average attendance per lecture for the pharmacy telelecture courses is shown in Table III. It should be noted that the mean attendance data is for participants, not enrollees, and was compiled in this manner to eliminate those individuals who enroll for courses but who never attend. This lack of attendance is common for the telelectures, since most of the hospital locations on the ETN pay a flat academic year fee which allows any or all of the professional people associated with the institution to enroll for ETN courses without charge. The elimination of the nonattenders was done to provide a more realistic picture of attendance patterns.

The data in Table III show that mean attendance per lecture has ranged from 71.6 to 83.8 percent of the participants for the nine courses under consideration. The differences in mean attendance per lecture from course to course were subjected to a Z test to determine significance.[13] The test revealed that the increase of 7.6 percent in average attendance per lecture between the 1968 and the 1969 courses was significant at the 5 percent level of probability error. The 6.9 percent increase from 1970 to 1971 was similarly significant, as was the 6.7 percent increase from 1973 to 1974.

An explanation of the significance of the increase in average attendance per lecture for the years noted above is partially attributed to the following reasons. The fall 1968 telelecture course was Clinical Considerations in Drug Therapy, a topic of particular interest to hospital pharmacists. It is suspected that the attendance of the community pharmacists was low for the course thus decreasing the average attendance per lecture below that which

Table III Number of Enrollees and Participants and Mean Attendance of Participants per Lecture for Pharmacy Telelectures

Date	Number of enrollees	Number of participants		Mean attendance per lecture		
	N	N	%	N	%	Increase over previous year
Spring 1968.	267	262	98.1	200	76.3	[a]
Fall 1968.	241	229	95.0	164	71.6	-4.7
Fall 1969.	328	307	93.6	243	79.2	7.6[b]
Fall 1970.	415	371	89.4	272	73.3	-5.9
Fall 1971.	394	339	86.0	272	80.2	6.9[b]
Fall 1972.	426	383	89.9	299	78.1	-2.1
Fall 1973.	521	449	86.2	345	76.8	-1.3
Fall 1974.	495	436	88.1	364	83.5	6.7[b]
Fall 1975.	490	458	93.5	384	83.8	0.3

[a] Data not available for previous course.
[b] Statistically significant at the 5 percent level of probability error.

was established for the pervious year's course, Advances in Pharmacology.

As mentioned above, the lecturer for three lectures of the 1970 course, Drug Interactions, was not well accepted as indicated by the feedback from the students. This certainly could account for the significant decreased average per lecture attendance from that set for the 1969 course, Antibiotics Seminar.

The average per lecture attendance for the 1974 course, Geriatric Considerations in Drug Therapy, set an all-time high of 83.5 percent, which was a 6.7 percent increase over the previous year. This probably represents a levelling off of average per lecture attendance at between 80 and 85 percent, if quality programming is maintained.

Summary

The use of Wisconsin's Educational Telephone Network (ETN) for providing continuing education for health professionals in general and pharmacists in particular has been described. Nine courses presented during the past eight years by Extension Services in Pharmacy have been analyzed with respect to enrollment fluctuations, to professional specialties of the enrollees, and to attendance patterns of the participants.

The analysis strongly substantiates the original observations of the telelecture method being a convenient, economical, and efficient means of providing continuing education by demonstrating increased growth in enrollments and the levels of attendance.[7,10] The telelecture method has become an indispensable adjunct to the other means by which Extension Services in Pharmacy can make quality continuing education available to the practitioners throughout the state.

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ETN: A TOOL FOR CONTINUING EDUCATION IN COMMUNICATION PROGRAMS

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In the University of Wisconsin-Extension design, Communication Programs encompasses in an inter-disciplinary structure all aspects of communication: library science, speech, journalism and mass communication, radio, television and cable, and photography and film.

Faculty and academic staff plan cooperatively to meet the continuing education needs of their colleagues in these fields and to extend to citizens an understanding of the importance of all facets of communication as represented by the competencies of the personnel in Communication Programs.

All means are used in programing to meet the assessed needs but ETN (the Educational Telephone Network) has become a major technological tool for making it possible for Communication Programs to reach out to a statewide clientele.

In 1974-75 ETN carried 25 programs for Communication Programs reaching 1598 persons. In 1975-76 the programming unit has scheduled 31 series or 291 hours of ETN time to reach persons with access to the 200 listening locations scattered around the state. Of that number of programs thirteen are in Journalism; twelve in Library Science, four in Cable; one in Photography and one in Radio and Television. ETN represents 31% of the programs planned in 1975-76 for the unit.

Programs offered in Communication follow the patterns established by all Extension program areas. The series range from onetwo-hour planning session to a fifteen three-hour graduate credit course in Medical Librarianship offered on Saturday mornings in the first semester. They have been scheduled from 10 AM to noon for public and medical librarians, a brown bag series at noon in public relations, and early evening series for school personnel. In other words scheduling must fit in with needs of other program areas but different times do fit the varying needs of the clientele.

The most successful series have been designed to meet specific needs as revealed by the participants themselves; been planned with the assistance of clientele committees; used articulate experts who could speak fluently and provocatively and respond immediately to comments and questions from the listeners; focused on practical topics and recognized problems rather than theoretical and philosophical statements; provided materials to be used later on the job, and were evaluated with the assistance of the staff of the Instructional Communications staff.

Phyllis Weiss, coordinator of Library Science programs, commented on the ETN experience from the viewpoint of the instructors with whom she has worked.

"The almost universal first reaction to using ETN as a teaching method is that it is a strange, weird experience--followed by an excitement that it "works" and reaches people with no other classroom situation available to them. Increased contact with this medium makes one feel less and less odd using it--and more and more convinced of its importance as a learning experience to its participants.

It is most effectively used for giving short (10-15 minute) presentations, followed by audience comments and questions. It is also very useful in bringing people together on a statewide basis to discuss issues and ideas, give a report, or plan a conference without anyone having to travel out of the city or county.

Relevant and useful content overcomes the minor inconveniences of the ETN system. It is limiting not to be able to gauge one's audience reactions or not to have more immediate inter-action (quick exchanges are very difficult to manage). It is also sometimes depressing for a participant to be sitting alone at a listening location. But even with the drawbacks, ETN offers educational possibilities that would otherwise be non-existent."

Robert Tottingham, Journalism, offered some helpful comments on ETN as a medium. He has said that "the most effective use of ETN has been in relatively small group remedial/updating in-service training for professionals. Where groups are small enough to get intimately engaged in conversational dialogue with each other and develop strong rapport with program leadership, more learning seems to take place and, as a result, more satisfactions are expressed through client evaluations.

Beginners in ETN usage need to have patience with with its limitations, both technical and programmatic, and be satisfied with limited early successes. Problems of timing and drawing of clients into two-way discourse are the programmatic constraints most encountered."

Major ETN locations are in county courthouses, hospitals and on university campuses but the eleven public libraries in Chippewa Falls, La Crosse, Madison, Manitowoc, Menomonee Falls, New Richmond, Plain, Reedsburg, Sheboygan, Wauwatosa, and West Allis have installed ETN equipment to make it easier for their staff members to participate in the ETN programs as part of their in-service programs. Most of the libraries limit the ETN use to library and library trustee programs only however, the Maude Shunk Public Library at Menomonee Falls has decided to use ETN as a community service. All Extension programs are made available at the public library. The library assists with publicity, helps with registration, sets up any audio visual equipment, handles attendance records and distributes materials to participants. The library has an obligation to see that only registered participants use the ETN equipment.

A public library is a natural site offering supplementary materials in addition to a convenient location and hours. As more libraries become involved and supportive of adults engaged in independent learning, hopefully they will accept a responsibility of sharing their ETN facilities with the adults in their communities as Maude Shunk Library does.

Using ETN for continuing education programs for professionals and other personnel in the communication fields makes it possible for them to earn CEU's (Continuing Education Units) because most ETN programs provide CEU's for satisfactory completion of the programs.

UW-Extension is participating in the growing national program of offering CEU's in recognition of self development and professional growth activities which prepare one for more effective job performance and career advancement. One CEU is usually defined as ten hours of participant effort in an organized continuing education experience under responsible sponsorship, capable direction and qualified instruction. The majority of the ETN offerings of Communication Programs do carry CEU's so they become a part of the cumulative record of accomplishment maintained for all who earn Extension CEU's. CEU's are increasingly being accepted as evidence of attainment by employers, certification and licensing agencies and professional associations.

The ETN courses offered by Communication Programs in 1975-76 have been varied in subject matter and format but they have all been planned to meet the educational needs of identifiable publics.

A very popular course, Photographic Masters, introduced six nationally recognized photographers personally to the students via the telephone. Sets of slides of their works reproduced and distributed to each listening location were the basis for discussion and evaluation.

In cable television four programs were offered to inform citizens, government officials and school personnel in 20 hours of ETN time. The titles of the topics covered were self-explanatory: (1) Copyright Problems in Media: School and Library Uses and Abuses (2) Cable Television, the Community and the Citizen: Guidelines for Local Decision Making (3) Cable TV/ Video Projects: Funding, Budgeting and Proposal Writing (4) Copyright Legislation: An Update on Current Federal Legislation.

ETN made it possible to invite FCC members, Congressmen, faculty members, governmental officials and attorneys to speak on the topics from their experience and with the latest and pertinent information.

Professionals in the fields of journalism and mass communication have a variety of needs for up-dating their knowledge. For instance, Nuclear Power Plants was designed to give editors and reporters an intense briefing in the technology of nuclear power facilities so they might meet the demand for public understanding. Management Techniques for Editors and News Directors was designed to prepare the individual for the role in middle management. Beginning Article Writing and Advanced Article Writing offered two levels of instruction: (1) for those interested in learning the elements of writing for magazines and (2) for those who wanted to improve their writing techniques. The instructor individually critiqued all lessons submitted.

Public relations and advertising is another aspect of mass communication that lends itself to programming via ETN. Weekly Diet of PR, a brown bag once-a-week noon hour program attracted 140 persons around the state. Political Advertising and Public Relations focused on campaigning techniques for political candidates complete with press conferences, media releases, fund raising and recruitment and use of volunteers in political organizations.

Working with school administrators and journalism teachers is an on-going activity of Communication Programs. ETN programing included: Making the Most of Your Yearbook, Education and the Community, Solving School News Press Problems and in-service training through Journalism/Mass Media Instruction in the Secondary School.

Since 1968 ETN has been used as a regular means of offering continuing education programs for librarians in all types of libraries but particularly for public and school library personnel.

In 1975-76 twelve programs have been offered via ETN including a graduate credit course on Medical Librarianship for the UW Library School with 38 students enrolled for fifteen Saturday mornings from September to December. In the computerized evaluation completed by all students 74% stated they would be interested in participating in future ETN courses.

The Medical Librarianship course was designed and offered with the Library School in direct response to the need expressed by librarians on a questionnaire which was sent to them by the Middleton Medical Library staff on the UW-Madison Campus. Requirements for certification by the Medical Library Association could be met by completing a course offered by an accredited library school. In response to the need the course (LS 742) was developed, well qualified medical librarians were the instuctors and ETN was the medium for offering the course on a statewide basis. In fact four librarians in Rochester (Minnesota) also participated via a tie-in through the telephone in St. Mary's Hospital in Rochester.

Since 1971 a non-credit course A51 Basic Library Management for Health Science Librarians has been offered on ETN with 87 completing it satisfactorily.

The syllabus originally written for A51 was revised this year by the Midwest Health Science Library Network and is available for use in the midwest states and for sale from the Midwest Management Office. It can be used as a textbook for any type of in-service training for non-professionals in health science libraries.

Since the passage of the 1971 state library law in Wisconsin, certification for public librarians has become mandatory and is the responsibility of the Division for Library Services/Department of Public Instruction. The library education requirement for Grades 2 and 3 may be met by satisfactorily completing A50 Basic Library Management for Public Librarians offered by UW-Extension, Communication Programs. Prior to 1968 the course was taught in regular classes set up in locations where there were enough students to meet Extension enrollment requirements. In 1968 the decision was made to experiment with ETN so that students wherever they were living would have convenient access to a listening location and could enroll. In 1975-76 two sections have been offered. Section A met for fourteen two-hour sessions every other Tuesday from 10:00 - 11:50 AM from September to April. Section B met every Monday from January to April. Between 1968 and 1976 344 persons were enrolled.

A study manual and a kit of materials are given to each student and a set of textbooks is loaned by the Extension Library. In addition to assigned readings for each topic there is a written assignment mailed to the instructor, commented upon and returned to the student. At the satisfactory completion of all assignments and a final exam the student receives a certificate from University Extension, and is eligible to apply for certification from the Division for Library Services. The student has also earned 7 CEU's (Continuing Education Units) from University Extension

Another program for public librarians offered continuously via ETN since 1968 is called Continuing Education for Public Librarians. The series of seven monthly sessions, November to May, are planned with the assistance of a committee of librarians representing as many aspects of public libraries as possible. Competent persons from Wisconsin or elsewhere are invited to participate as speakers. Public library systems are encouraged to enroll their member libraries and many use the series as part of their regular in-service training programs. In 1975-76 126 libraries were enrolled and attendance averages 125 librarians.

A continuous series for school library/media personnel has been offered annually in the fall since 1968. The first series attracted 435 persons but the numbers have decreased since then so only 90 participated in 1975 but they represented all parts of the state and size of school and were enthusiastic in their evaluation of the series. Acceptance by school administrators that the CEU's which they receive will meet in-service training requirements in their local school district will continue to be a powerful factor in the success of the series as far as enrollment figures are concerned.

The state library agency, the Division for Library Services works closely with Communication Programs in planning the library series. In fact, the Division has offered study grants to public librarians to cover the fees for A50 under its State Plan for LSCA, Providing Educational Opportunities for Public Library Personnel. Since using ETN to reach out in training activities in Wisconsin the number of small communities that have participated in A50 has at least tripled.

Special evening series for public library trustees were presented in 1972 and 1973 via ETN. By tape and "live" by telephone hook ups the trustees could hear and discuss their questions with such persons as Mrs. Robert Ihrig and Mrs. Virginia Young, past presidents of the American Library Trustee Association and Richard Krug, former librarian of Milwaukee Public Library and other state and national authorities.

Books and Librarians, a program based on reading and discussing books with the assistance of UW faculty members, has become a regularly scheduled series in fall and spring and attracts librarians and other adults interested in discussing books.

A new series on Indian Library Service, is one aspect of an Indian Library Trainee program in which nine Indians are involved in a training program to prepare them to establish and operate libraries in their Indian communities. The students are also enrolled in A50 Basic Library Management for Public Librarians.

ETN (the Educational Telephone Network) as part of the Instructional Communications System is evidence of University Extension's vital concern with the day-to-day problems of the professionals and consumers alike which can be met by using technology of the most familiar kind, the telephone, but in a creative way so that it becomes the means of implementing the "Wisconsin Idea", making the "boundaries of University of Wisconsin campus the boundaries of the state." In the 1970's the dream has become a reality through technology.

Readings

"The Community Uses ETN Through the Menomonee Falls (Wisconsin) Library" by Richard Crane. Wisconsin Library Bulletin, July-August 1973

"ETN: New Approach to Continuing Education" Wisconsin Library Bulletin, May-June 1971

"In-service Training Through ETN (Educational Telephone Network) by Bernard Franckowiak in In-Service: School Library Media Workshops and Conferences by Nancy Polette. Scarecrow Press. 1973

PARTY-LINE EDUCATION FOR INACTIVE NURSES IN WISCONSIN

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"It provided a great deal of psychological support for me to hear people my own age and/or older who managed to accomplish what seems so impossible to me at this moment - a return to nursing. This discussion by my peers met some of my needs in a way only other nurses could. I feel very strongly that each inactive nurse could gain a great deal from hearing this." This is the feeling of an inactive nurse participant following the 95th multi-point Wisconsin Inactive Nurse Studies (W.I.N.S.) telephone conference. The January 26, 1976, party-line class, "Avenues for Returning to Nursing Practice," included four personal accounts of re-entry to the practice of nursing.

Purpose

The University of Wisconsin-Extension, Department of Nursing is concerned about the continuing education of professional nurses in Wisconsin. One of its specific goals is "to provide opportunities for the non-practicing nurse to relate to nursing and/or to facilitate a return to practice." The Educational Telephone Network system has proven to be an effective teaching/learning approach with excellent outreach that helps to meet this objective.

The combined impact of the changing nature of disease, increased longevity, acceleration of new health discoveries, and new technology all prompted the non-practicing nurse to feel impelled to keep professionally informed. Whether or not she plans to return to employment in the immediate future, she realizes the necessity to keep familiar within her chosen profession.[1] W.I.N.S.' unique design focuses on meeting these learning needs. Thus, the Wisconsin Inactive Nurse Studies project was implemented in March, 1969. Signe S. Cooper, R.N., Professor and Chairman of the Department of Nursing, designed and directs the program.

Program

A. ETN. Statewide telephone conferences for nurses were initiated by the University of Wisconsin-Extension, Department of Nursing, in February, 1966.[2] The telelecture method of instruction was piloted by the University of Wisconsin-Extension in 1965,[3] and is now used extensively by the health sciences disciplines of the University of Wisconsin-Extension.[4] "ETN" became a familiar medium to hundreds of nurses throughout the state as they received instant information from knowledgeable health care practitioners in a variety of settings.

The technological data and all of its applications in the present and future have been well described in the literature by experts in the field of communication. Thus this paper will not attempt to include that specialized information.

B. WRMP. A non-credit offering, W.I.N.S. became a reality under a grant from the Wisconsin Regional Medical Programs, Inc. The early mission of WRMP was to provide for programs that emphasized the blend of scientific and technical advancement with the delivery of health care. W.I.N.S. teleconferencing was one phase of a three-pronged proposal. The other phases provided (1) special refresher courses for the inactive nurse,[5] and (2) self-study units on selected nursing subjects.[6]

The W.I.N.S. program is intended to assist the inactive professional nurse to keep in touch with recent trends and developments in nursing and health care in general, to offer instruction of the highest caliber, to acquaint her with resources for continued individual learning, to facilitate a return to active practice, and to become a better informed citizen within the community.

Because timing of the federal funding (March) did not coincide with the beginning of the University academic calendar year (September), scheduling ETN line time was difficult. Interdepartmental cooperation resulted in the assignment of four ETN class hours during April and May, 1969. These early sessions were open to any inactive nurse in Wisconsin on a no-fee basis. By May 14, 1969, the enrollment reached 450. In September, 1969, 550 nurses had enrolled (about 100 of these indicated they were actively employed either full or part-time). Although they recognize the program is designed for the non-practicing nurse, approximately one-fourth of those enrolled each year is employed.

C. Advisory Committee. A W.I.N.S. Advisory Committee, established in March, 1969, has offered a major service to the W.I.N.S. program. Members of this group include three inactive nurses and faculty representatives from hospital inservice departments and the University of Wisconsin-Extension, Department of Nursing. The charge of the committee is to assist with selection of course content, ad hoc faculty, and evaluation of the program. The committee meets annually to assist with curriculum planning.

D. Publicity. Identifying the inactive nurse was, and remains, a challenge. The numerous methods of publicity commonly used for announcing educational offerings had to be telescoped into a four-week period to meet the initial program date. Brochures describing W.I.N.S. were sent to continuing education agents and local Educational Telephone Network program administrators within the University of Wisconsin-Extension. Further announcements were mailed to health care agencies and professional organizations, respected nursing leaders in the state, and identified inactive nurses.

The University of Wisconsin-Extension Public Information Department prepared and disseminated appropriate releases for newspaper and radio around the state. Because the target population is difficult to reach, W.I.N.S. needs more effective publicity.

The media, in many counties and individual communities, provides visibility for this program of continuing education in nursing. However, a May, 1975, survey of 296 participants indicated that 31% first learned of the program through a friend. This supports the one-to-one personal avenue of publicity. Somewhat related is the sizeable percentage of re-enrollees each year. Records also indicate a number of inactives who have maintained their participatory learning for the life of the program.

E. Content. A primary concern is that of program quality. Continual effort is exercised to improve the suitability and to maintain the high quality of course content. The resource faculty invited to participate are recognized for their expertise in the subject areas. The direct dial feature of ETN has permitted national health leaders from distant locations to share views with individuals who might otherwise not have such opportunities.

A prime ingredient in identifying course content is the direct input from participants. The series is a blend, therefore, of the expressed learning needs of the participating group and the overall purpose of the program, to professionally update the inactive nurse.

F. Structure. The seventh annual consecutive W.I.N.S. Educational Telephone Network series has just ended. Each series consists of fourteen fifty-minute sessions offered twice monthly from September through May, excluding the month of December. Program format remains flexible. Variations of the lecture method of presentation used effectively include the panel, interview, case study, group discussion, and dialogue. The type of program format is the cooperative decision of guest faculty and the coordinator.

G. Supportive Materials. With no actual picture transmission capabilities in the ETN system, visual aids frequently used are charts, graphs, diagrams, and photographs. Slides are not incorporated in the W.I.N.S. presentations because of the uniqueness of the participating group and the great variations at the system locations around the state. Study guides, lesson outlines, reference materials, and printed introductions to the guest instructor help to increase the participants' attention, as well as to encourage verbal interaction.

Carefully planned supplementary instructional materials are mailed to the enrollees. In February, 1976, the syllabus format was introduced. These enclosures provide an important communication mechanism between instructor and student, especially in the absence of face-to-face contact.

In an effort to acquaint the individual with learning resources[7] for continued self-improvement, participants are continually directed to other innovative instructional systems, such as NURSING DIAL ACCESS.[8]

Another resource W.I.N.S. participants are encouraged to use is the Medical Library Service of the William S. Middleton Health Sciences Library on the University of Wisconsin-Madison campus. This facility has a wealth of resources for information retrieval that helps to complement the teleconference. Requests for services may be channeled through any public or hospital library or by direct communication with the health science libraries in the state. Services include: loan of books and journals; photocopying of journal articles; answers to reference questions and preparation of bibliographies.

The Library of University of Wisconsin-Extension, Madison, also serves students enrolled in Extension classes. In addition, inactive nurses are encouraged to visit hospital and health agency libraries near their homes.

H. Presentation. Participants value the open discussion part of each program. Lively discussions, and intense questioning of guest experts reflects enthusiastic desire for more information.

These programs are professionally recorded. Cassette copies may be purchased directly from Instructional Communications Systems. Furthermore, an individual who lives in an area without ETN facilities may participate by borrowing the taped programs from the Department of Nursing. Currently, twenty-two enrollees are following this pattern.

Although we have seventeen out-of-state enrollees, we would be overwhelmed with requests if the availability of the program cassettes was generally publicized outside the state.

In September of 1975 the special feature of program replays was initiated. These straight recordings of the original teleconference have been scheduled to meet the needs of nurses unable to attend the "live" programs.

Funding Mechanism

Wisconsin Regional Medical Program funding extended from March, 1969 through August, 1970. The initial grant from WRMP provided support for the introduction of this opportunity for continued learning to nurses in Wisconsin.

The program has been continued because faculty believe an important public service is provided. Ad hoc faculty generally participate without an honorarium. Enrollments demonstrate steady and continual gains in progressive years, thus compounding many facets of the total program. Cooperative support of other health care agencies and professional organizations has been gratifying. Curtailment of funds, however, has restricted further expansion.

Guest Faculty

Preparation of guest faculty who teach in the W.I.N.S. series is a significant component of the program effectiveness. The coordinator initially communicates with faculty by telephone. Guidelines for presentation and preparation of printed materials for the learner are detailed by letter. Samples of supportive materials relating to a previous program are given to guest faculty. An offer of a personal visit is extended to expand on the faculty expectations, program objectives, profile of the learners, and concerns about the instructional medium. Additionally, some instructors wish to audit a previous W.I.N.S. teleconference via cassette tape. As the scheduled date approaches, there is another telephone visit.

Guest faculty also play an important part in the continuity of the class. As direct participant reactions and questions are submitted, responses are sought out, either directly from guest faculty or from other resources. This information is relayed directly to the participant by telephone or letter. The integration of this process is extremely time consuming, yet vital. This necessary linkage provides a positive climate for the participant, and serves as a motivating force to the instructor.[9]

Evaluation

Adults are ready and willing to learn via telephone. This is graphically illustrated in the effort some participants make to attend these programs: traveling long distances year round to ETN locations, hiring baby-sitters, and making special trips to area libraries for reference reading.

A response form is provided for each program. This serves as an important bridge between the Department and participant and prompts heavy telephone usage for feedback to learners.

Periodic surveying of participants is conducted on a semester basis. In this questionnaire, each person is asked to identify behavioral changes, whether it be knowledge skill or attitudes, that have resulted from this learning experience. Participants share reactions and experiences freely and openly. Example upon example indicates how each has extended her capacity to meet the staggering needs of our society.

Although a testing mechanism is not a part of the regular format, quizzes are occasionally used by the instructor.

In cooperation with the Instructional Communications Systems Department, a Program Evaluation Checklist (PEC) has been conducted several times. This evaluation system examines the relationship between the ETN system and the educational objectives of the program. Its purpose is to measure the strengths and weaknesses so as to provide a basis for continued program improvement.

CEU. Up to one and four-tenths of a Continuing Education Unit (CEU) is offered for participation in this series. CEU are awarded on the basis of attendance and completion of semester evaluation forms within the specific deadline. In January, 1976, 232 of 320 (73%) submitted evaluation forms for recognition of their participation in W.I.N.S.

Peripheral Programs

A number of peripheral program offerings have grown out of the W.I.N.S. program. The Annual Clinical Conference[10] for Inactive Nurses is an example. This one-day conference in a hospital setting permits participants face-to-face interaction with guest faculty and promotes a positive up-to-date image of nursing.

A second expanded feature is the "recycling of teleconferences." This is a loan arrangement of selected past W.I.N.S. programs via audio cassettes through the Medical Library Services of the University of Wisconsin System. W.I.N.S. AUDIOTAPES policy establishes a waiting period of six months following a series completion before the cassette copies may be circulated. These tapes provide easy access to educational opportunities for those unable to participate in the "live" network programs.

Summary and Conclusion

Those old-fashioned multi-point party-lines may have disappeared in most sections of the United States, but the special statewide system of ETN, headquartered in the University of Wisconsin-Extension, Madison, is providing a communication climate for a very important group of citizens of the state.

A professionally informed inactive nurse has many opportunities to reach out and contribute as a member of her community. Likewise, a number of W.I.N.S. participants have been influenced to return to active nursing as a result of participating in the program. After seven years of programming, W.I.N.S. continues to be well received, and is a unique use of the telephone, in this, the tenth year of ETN, the hundredth year of the telephone, and two-hundredth year of our nation.

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NURSING DIAL ACCESS:
A RESOURCE FOR IN-SERVICE EDUCATION

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NURSING DIAL ACCESS is a library of short audiotapes available by telephone to Wisconsin nurses and developed by the Department of Nursing, Health Sciences Unit, University of Wisconsin-Extension.[1] The concept of such a service was pioneered for Wisconsin physicians in 1966 by Dr. Thomas C. Meyer, chairman of the Department of Continuing Medical Education, University of Wisconsin-Extension, and associate dean of the University's Medical School.[2] Developed jointly, the medical and nursing components of the Dial Access Library for Physicians and Nurses issue a brochure listing more than 600 tapes.

Since initiation of NURSING DIAL ACCESS, the nursing component, in September 1968, nearly 120,000 calls have been accepted from Wisconsin nursing personnel. This is an average of over 1300 calls a month. At present, calls into the Library are also received from physicians and nurses in the Veteran's Administration. Previously, contracts for service were in effect from Regional Medical Programs in North Dakota and Minnesota, the United States Public Health Service, and the American Telegraph and Telephone Company.

Until 1972, NURSING DIAL ACCESS was funded, in part, by the Wisconsin Regional Medical Program, Inc. Since that date, funding has been through federal Extension Service funds. From inception of service, Wisconsin nurses have been able to call the Library from any telephone within the state to hear tapes at no cost to them.

The nursing tapes, usually five to eight minutes in length, present core information about nursing care in emergency situations, new procedures and equipment, recent developments in nursing, legal aspects of the profession, and quality assurance concepts. The availability of information when the learner needs and wants it is an important facet, and answering service is provided around the clock.

The program was designed primarily to meet the needs of those nurses practicing in isolated settings, either geographically or by occupation, as these practitioners frequently do not have ready resources for continuing education. However, the Library has also been widely used as a teaching resource by instructors in schools of nursing and by in-service educators in staff development programs. The focus of this paper will be on the use of NURSING DIAL ACCESS as a resource for in-service education.

Use in In-service

Faculty in the Department of Nursing have continuing, close contact with many of Wisconsin's nursing in-service educators through both formalized offerings and informal association. It has thus been possible to discuss with them the ways they have used NURSING DIAL ACCESS in staff development programs. These educators were quick to recognize the usefulness of this tool for continued learning, and their enthusiasm encouraged other nurses to use the Library for self-directed professional growth.

The intent of the NURSING DIAL ACCESS program is that every professional nurse in Wisconsin should have access to the brochure listing tapes. One of the methods used for distribution has been through the in-service educator. When a brochure is printed or a supplement of new tape listings issued, copies in bulk supply are sent to the in-service department at each hospital, nursing home, health institution or agency in Wisconsin. In-service educators, then, can distribute these to professional nurses in practice on these staffs.

Orientation Folders. Since there is a ready supply of brochures available to the in-service department, some educators have found that placing them in the orientation folders of new nurses is an effective introduction to NURSING DIAL ACCESS. Auditing of tapes related to the specific area of practice of the new nurse may also be suggested. Without exception, educators report excitement in use of this resource expressed by those moving into Wisconsin from other states where learning by telephone is not established for continuing nursing education.

Nursing Unit. By maintaining a sufficient supply of current catalogues, the in-service educator may also keep copies posted in each nursing unit and on mobile education carts for immediate access. Evening and night nurses, who often encounter difficulties in attending continuing education offerings, are particularly encouraged to use the Library during work hours. The around-the-clock answering service is an especially useful feature to these nurses.

Bibliographies. Tapes in the Library may also be included in references prepared for in-service classes. For example, the brochure lists twenty tapes relating to arthritis and rheumatic disease. Some of these topics include: Juvenile Rheumatoid Arthritis, Rheumatoid Variants, The Proper Use of Cortisone in Arthritis, Counseling Persons with Lupus Erythematosus, and Physical Therapy - A Necessity in Rheumatoid Arthritis. Depending upon relevance, one or more of the series may be suggested for class preparation. A specific tape may be used to initiate discussion, to reinforce points brought out in class, or to trigger individual exploration of additional information.

On occasion, faculty in the Department of Nursing prepare lists of related tapes, as for example, those concerned with diabetes, cancer, and geriatrics. These lists are primarily developed for use in clinical conferences sponsored by the Department but may also be useful to in-service educators.

During the developing years of NURSING DIAL ACCESS, authors of nursing tapes were requested to provide three references, which were compiled into a bibliography for all nursing tapes in the Library. The bibliographies were available on request, and in-service educators found them a valuable addition to their own. However, the amount of time and work involved in keeping the bibliographies updated was excessive, and this feature of the program has been discontinued.

In-service departments in some hospitals and public health agencies have installed telephone amplifiers to provide group listening.[3] Such a mechanism assures that each class member has access to identical information for further discussion. In one public health agency, the group, including a physician-lecturer, listened to a tape on dialysis, which was then used as the basis for his clinical presentation of the topic.

Content a Resource. A nurse preparing to teach in-service classes may find the content of tapes helpful. For instance, the instructor may not be familiar with some community resources for continuity of patient care. If this topic is scheduled for discussion, the nurse may audit the tapes on Home Care and Homemaker Services, Referral Agencies for Rehabilitation, Resources for the Cancer Patient, or similar topics.

Encourage Scripts Preparation. In-service educators have also been instrumental in encouraging nurses with clinical expertise to prepare tapes for the Library. Sometimes a nursing team may develop a series of related topics as a group effort. This was done by nurses in a Renal Unit at a Veteran's Administration hospital who prepared scripts for the following topics: Hemodialysis - What is it?; Nursing Aspects of Hemodialysis; Peritoneal Dialysis - What is it?; and Nursing Aspects of Peritoneal Dialysis.

Quality Assurance Project

A spin-off of the NURSING DIAL ACCESS program was the development in 1974 of a series of tapes relating to quality assurance programs in nursing. The federal government now requires monitoring of quality and utilization for the care that it purchases through Medicare, Medicaid, and Maternal and Child Health programs. The Nursing Committee of the Wisconsin Regional Medical Program, Inc., in an effort to disseminate information relative to methods of implementing quality care programs, worked with the Department of Nursing to provide a series of tapes for inclusion in the Library. These tapes were also made available for purchase, and in-service educators did use them as their staffs began to prepare for quality assurance requirements. Access to this information in a more permanent form seemed sufficiently urgent that scripts for the tapes were then published as a booklet and have been available for purchase for the past eight months.[4]

Need to Expand Tape Development

The audiotape market for telephone access libraries and related uses is ripe. NURSING DIAL ACCESS is about to complete its eight year in operation, and the primary hurdle faced (other than seeking a continuing funding base) is the need to develop tapes. Because of budget limitations, it has not been possible to pay an honorarium to authors, and the continuing search for those who have both the expertise and willingness to prepare scripts is an arduous one.

Because tapes are designed to focus on a narrow scope of information, this medium is not intended to serve as a primary source for continuing education. NURSING DIAL ACCESS is but one tool in the program of the Department of Nursing, but it continues to be a popular and valuable mechanism for providing information to the learner at a time convenient to him.

To those attending this conference who are in the business of providing software, my plea is that you consider the commercial development of carefully prepared tapes for uses such as ours. It might be helpful, also, if provisions could be considered for making inexpensive, custom-made tapes for those who have specific information for limited distribution but do not have access to recording services. An example might be an interpretation of an agency policy or procedure. The availability of tapes might encourage the proliferation of in-house or in-city telephone access libraries for a variety of educational purposes.

With today's focus on continuing education and self-help information, the exploration and use of technology is a concern for educators. At the present time, one mechanism that performs the function of bringing information to an individual through a readily accessible means is the telephone. Nursing in-service educators have found that NURSING DIAL ACCESS, with its provision of availability of information when the learner needs and wants it, combined with the accessibility of the medium, the telephone, can be a good resource for use in staff development programs. The Wisconsin experience with a number of telephone access libraries has shown this to be an acceptable method of providing nearly-instantaneous information. If the tapes are good, the service adequate, and promotion carefully executed, the library will be used.

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IMPROVING COMMUNICATION EFFECTIVENESS OVER E T N

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Many books and articles have been written about the art and science of communication . . . what is it, when and why does it happen or not happen, and what can be done about it. This paper will examine the concept of communication within the context of the ETN and discuss why sometimes communication does not take place, and what can be done to improve the odds of effective communication when using the ETN media.

Many of the problems of communication in education and within organizations can be traced to the mistaken notion that because we transmit information we have, in fact, communicated. The act of writing a letter or speaking over an ETN network is not communication, but only part of a process which, if successful, can be called "communication."

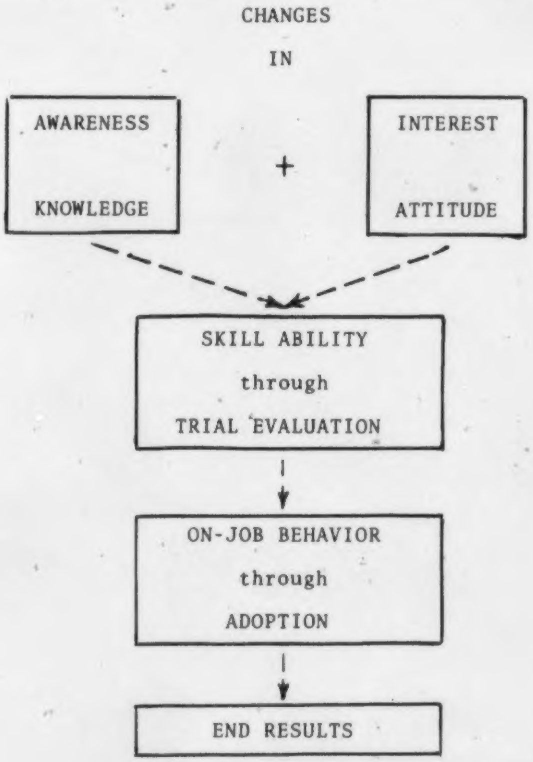
What is Communication?

The dictionary defines the verb "communicate" . . . to impart, to convey, to make known. The concept "to make known" perhaps is most helpful in that it implies not only the transmission of information, but also the willingness and capability to receive and the ability to comprehend and understand that which is received. Somehow what communication intends is that the concept or idea within the head of one person gets moved inside the head of some other person(s). When we stop and think about that intention, we realize that communication isn't all that easy because many concepts and ideas do not fit comfortably into "words" but fit better into that which is commonly known as "body language" . . . the message requires a visual as well as an aural cue, and that there always is an element of risk-taking based on trust when open communication actually takes place.

Why Communicate?

What is the general objective of an ETN presentation? If development, education, training or change be one of the answers, then it behooves us to briefly examine a model of development . . . just to make certain we know what it is we are trying to do when we give a presentation on ETN.

Consider the following model, which borrows heavily from two sources, Robert House[1] and Philip Brereton[2] (I cannot tell you from whom they borrowed). This model suggests that development is a process (a series of changes) beginning with awareness (the acquisition of knowledge). However, this knowledge/awareness is only the first of a series of steps leading eventually toward some modification of behavior or the adoption of an innovation which may, or may not, lead to the kind of changes in end-results which originally stimulated the development program.



Thus, as a communicator/educator concerned with individual development, we must realize how limited we are in what we can accomplish within the development process. Our key opportunities, in most circumstances, are limited to the first two stages of this process, that of imparting information and building a positive climate in regard to that information which will increase the odds that some trial and evaluation will take place. We also recognize that the organizational climate in which the individual works may have a much greater impact upon whether any trial (risk-taking) takes place than anything which we say.

Why Communication Fails and Opportunities for Change

In order to maximize the effectiveness of our communication efforts within an ETN system, this paper now considers four issues which may help to explain why transmitted information frequently fails to accomplish its intended result, and what can be done to reduce the communication barriers and improve the effectiveness of this communication process. The four issues are:

1. Overcoming unrealistic objectives or learning to be satisfied with less
2. Semantics - impact on credibility and ego
3. Dealing with the "who is speaking" of ETN
4. Listening - it must be supported.

1. Overcoming unrealistic objectives or learning to be satisfied with less. Frequently the educator/communicator, because of a shortage of time for preparation or presentation, fails to plan his/her presentation to the point of being able to answer WHAT IS MY SPECIFIC OBJECTIVE FOR THIS PRESENTATION? and CAN THIS OBJECTIVE BE ACCOMPLISHED WITH THE TIME AVAILABLE USING THIS PARTICULAR MEDIA? (which reminds me of a personal frustration . . . I want to walk out every time a speaker says "there is not enough time" when, in fact, he/she knew in advance how much time was available and failed to tailor the message to the available time.)

What are the questions which the educator/communicator should be asking as he/she prepares an ETN session? Following are some which may help prevent unrealistic objectives:

a. what do I want done - what am I trying to accomplish? (reference to the development model is helpful in clarifying that which realistically can be accomplished.)

b. what concept or idea am I trying to communicate?

c. what is known or not known about the subject (how do I avoid losing those who already have some background while providing necessary background for those who need it?)

d. what information is needed, and in what form can that information best be understood?

e. what is the attitude of the receiver about this subject? to what degree will the receiver need examples to lend credibility, need additional written information to lend outside authenticity? to what degree will the receiver need an opportunity to think about/talk about this idea with colleagues.

f. how well do I understand the problem/subject myself - an individual cannot communicate something which he/she does not understand.

Finally, having found answers to these questions, the educator/communicator must ask, can I really achieve my stated objective in the time available? If yes, go ahead with your preparation, but with one suggestion in mind . . . always have in mind what is essential and what is nice-to-know information (some people call this "setting priorities") so that as you make your presentation you always are in the position to add/delete based on the speed with which you cover your material.

If, after asking these questions, the stated objective seems unrealistic, we have no choice but to redesign our objectives to that which is possible, so that we never are in the position of having to apologize for the lack of time (or blame the person who invited us for not giving us enough time). In addition, an unrealistic objective puts us in the position of FAILING NO MATTER HOW WELL WE DO, and that is an absurd position in which to be.

One further thought on how much can be covered in the available time. As most of us have discovered, much more material can be covered if we make available to the program participants a detailed outline and comprehensive handout material. Thus, the time which would have been spent writing on the blackboard or flipchart can instead be devoted to covering more material (I'll come back to this subject later when talking about listening effectiveness). However, a major concern is the danger of overload. A recent program evaluation of mine had the following comment: "It was difficult to absorb so much at once; the problem results from the fact that you have too much good information . . . I desperately wanted to give full attention to each new handout and concept, but I needed more time to think." Perhaps this only reflects my own personal need to keep myself and everyone else busy . . . however, there is a limit as to how much can be absorbed in any given period of time.

2. Semantics - impact on credibility and ego. There is a common error which communicators make . . . that words mean something. This is a serious mistake and, instead, we need to learn that words are just pointers toward understanding. As a communicator, words mean not what we intend them to mean but what the receiver intends, and we must, of necessity, put our message into his/her frame of reference in order for that message to be internalized.

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Closely associated with the process of conveying meaning are the ego needs for recognition, for acceptance, and for doing the "right" thing . . . and, when we stop and ponder a moment, we realize that these ego needs depend upon words being understood in the same way by both sender and receiver. An interesting experiment in communication, which has been used in a number of face-to-face workshops, emphasizes the ego/emotional hazards which exist if communication fails. This experiment is built around ambiguous instructions (the participants are told that this is an experiment and that they will be graded based on how well they follow the instructions), but they are not told to be beware of instructions like "fold your paper in half" which seems simple enough but, obviously, can be done several different ways. Therefore, when the grading is done and almost everyone folded their paper in half the "wrong" way, it doesn't come as a surprise that some of the participants show some degree of annoyance at the scoring process and, by proxy, with the communicator. Then, when the question is asked, "whose fault is it that you folded your paper in the wrong way?", there is surprising reticence, despite the annoyance, to blame the communicator. The most critical fact, however, is that the communicator has introduced the issue of credibility and, even though there is hesitation in laying blame on the communicator, there is much less hesitation in recognizing the communicator's loss of credibility in the eyes of the participants.

The impact of experience also needs to be examined when discussing the role of semantics related to credibility and ego. Consider two examples. First, the concept of participatory management becomes controversial, not so much based on any disagreement with the theory of participation, but based on whatever experience the individual has had with a management style which has been called "participatory management." Thus, hearing the words "participatory management" can evoke such differing images as commitment and responsibility to one person and chaos and irresponsibility to another.

A second example reflects the difficulty which many persons in central offices have in communicating with persons in regional, county or community offices. Experience has taught many persons that the word "suggest" has a very different feeling and meaning when coming from an outside consultant than it does from a funding source. In addition, a word such as "control" (which simply refers to the feedback process in a well-designed information system) has very different overtones when coming from central office than from a client. It is unfortunate, but persons who represent authority must be extra sensitive to the history of parent-child, hierarchical words which have permeated much of the communication between state and local personnel or, for that matter, between professor and student.

Thus, as an educator/communicator we might be well advised to have a reminder over our desk to the effect that "there is no such thing as a statement which cannot be misunderstood," and right next to that another message, "look to people, not words, as the source of meaning."

3. Dealing with the "who is speaking" of ETN. Stop for a moment and recall, what is the first thing that you do when you receive a letter . . . you look to see who sent the letter. Why? Because your feelings about and relationship with the sender determine the framework in which the letter is read (or not read). The "Who" in communication is VERY important. Again, referring to the previous section on semantics, the words which we read, even though we impute our own interpretation to those words, are colored by our knowledge and attitude about the sender of that message.

What can be done to give a sense of identification with, a sense of empathy with, the ETN educator? The easiest and least expensive thing to do is prepare a thoughtful and well-aimed introduction of the educator. One of the most interesting research results which I recall in this area of communication was based simply on varying the introductory comments for a speaker. The same individual gave the same presentation to three similar groups, but the introductions varied from friend and supporter to neutral researcher to critic and change agent . . . and the impact of the introduction was such as to completely color the perceptions and responses of the listeners as expressed in their evaluation comments. A second thing to do, also relatively easy and inexpensive, is to send the listeners a picture and brief biographical sketch of the educator. The biographical sketch and/or the introduction should be presented in such a way as to give a positive answer to the question, "why should I pay attention to this unknown person?"

One helpful supplement, if time, energy and budget permit, is to use this same educator on regional workshops and conferences or at the annual meeting of the state professional society. Multiple exposure, while it obviously has some risks, seems to have a high payoff in increasing the involvement and identification with an ETN educator . . . and since there is the potential for a two-way learning experience, this multiple exposure also tends to result in more effective preparation and presentation by the educator.

4. Listening . . . it must be supported. Listening is not a passive function; it requires mental effort and, in order for the individual listener to maximize his/her mental effort, requires considerable support from us, the educator/communicator.

Why is listening difficult even under the best of conditions? Several factors seem to combine to provide a challenge which the communicator must confront. For example, the average listener has a much greater input capacity than the normal rate of input. Nichols[3] suggests that the average adult can be trained to receive 450 words per minute through listening, and yet the average speaker goes at the rate of 100-150 words per minute. Thus, the listener has two/thirds of the time available to do things other than listen.

That is where the problem and the opportunity lies . . . in the constructive use of all this "free time." But first one more challenge. Nichols also has indicated that our ability to remember is highly limited . . . that we forget half of what we hear almost instantaneously and, over a short period of time, forget half of the remainder. Therefore, even when we try we seldom remember more than one/fourth of what comes as input . . . unless we have some crutches on which to lean. And here is the key opportunity for an ETN educator!

Following are some practical guides to improve the quality of listening via ETN:

a. always give the listener an outline of your presentation; this will not only support comprehension of the subject matter (by getting a clear sense of where you are and where you are going), but will support note-taking as one constructive use of the "free time"

b. always include handout material of anything which is complex or simply has a great number of details; of anything which needs to be precise; and of anything which best can be described in pictorial or graphic form. (The only occasion in which we have been criticized for too many handouts was when we tried to cover too much material, and the large supply of handouts merely highlighted our poor planning)

c. always assume that the ETN participants are poor listeners . . . which means that whenever we challenge them with an interesting idea or concept, assume that they will start to apply this idea in their head rather than pay attention to what we are saying next; therefore, never assume that anyone knows where we are in our outline and keep giving clues as to where we can be found when the listener is ready to return (this also reinforces the value of a detailed outline so that the listener can, in fact, feel comfortable in following an interesting idea for a moment without fear of getting completely lost)

d. always keep in mind that most people find it difficult to understand purely auditory concepts; they suspect the ear; in general, we feel more secure when things are visible, when we can "see for ourselves." The spoken word has the great strength of being able to communicate the spirit of the message as well as the content but, because of its shortcomings, we optimize listening (and communication effectiveness) by a well-designed combination of written and spoken words.

Closing Thoughts

Will attention to all these communication issues assure an effective presentation? . . . obviously not, unfortunately. In fact, the primary objectives of this paper are directed only to the first three stages of the development model presented early in the paper . . . to help educators/communicators become aware of some of the pitfalls in communication via ETN and to become interested in some of the possible actions which can be taken to avoid or overcome these pitfalls . . . and to encourage educators to experiment a bit with some of these concepts next time you venture into the world of ETN.

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1. House, Robert, "Management Development is a Game," Harvard Business Review, July-August, 1963.

2. Brereton, Philip R., "New Model for Effecting Change," Journal of Extension, Spring, 1972.

3. Nichols, Ralph, "Listening, What Price Inefficiency?," Office Executive, April, 1959.

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GARDEN DIAL ACCESS

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The Dane County University of Wisconsin Extension Office in Madison, like extension offices throughout the country, has experienced a substantial increase in recent years in home gardener demand. Certainly the increase in leisure time would have to be given as one reason for this increased gardening activity. Also, increased food prices have created a large increase in the number of people raising vegetable gardens.

Garden Dial Access was initiated in Dane County in the spring of 1974 because of the great demand for horticultural information. It was no longer possible for one horticulturist to do an effective job of answering all the gardening and related questions coming into the extension office.

Garden Dial Access is a library of tapes available to the public via the telephone. Most of the tape messages are two to four minutes in length. The system provides a 24 hour a day, 7 day a week service to the home gardeners on topics which include house plants, flowers, vegetables, fruit, lawns, and ornamentals and landscaping.

The Dial Access system was nothing new to many Wisconsin residents. However, it was new to gardeners. For several years, taped libraries have been available to doctors, nurses, students, and others through the University of Wisconsin Communication Center. The gardening tapes were simply added to this existing library of tapes.

In order to use the Dial Access system, the gardener must have a listing of the available tapes which are all numbered. The user then dials 263-3100. When the operator answers the tape must be requested by the number. When the tape has finished playing you are automatically disconnected. If the user wishes to hear more than one tape he/she must call the operator for each tape. However, this is not a problem, as it is a toll free number for Dane County residents.

Dial Access was an addition to an already ongoing horticulture extension program being conducted in Dane County. News stories, radio shows, T.V. appearances, individual phone consultations, homeowner clinics, and garden center training are all programs which were previously being provided. Dial Access has some advantages over all the other programs in that it can:

- Answer specific questions when needed. (Evenings and weekends when people are working)
- Can help large numbers of people.
- Once tapes are prepared, takes little time of the horticulturist.
- Saves money as it would be impossible for such great numbers of inquiries to be handled without adding additional staff.

Constant promotion has been the real key to the success of the program. Radio, T.V., and newspapers have been used to advertise the Dial Access garden tapes. Newspapers appear to be the most effective. The most calls were received when newspapers carried special stories on the program along with a listing of the garden tapes.

Due to the tremendous acceptance of the garden tapes, canning and freezing tapes were added on June 9, 1974. The system then became known as the Dane County Home and Garden Dial Access. These tapes were also heavily used and by early October more than 26,000 total requests had been received.

The following spring both the garden and food preservation tapes were updated and the new listing of Dial Access tapes went into effect on March 9, 1975.

During 1975, a very extensive telephone survey was done to evaluate the success of Dane County Home and Garden Dial Access. Random users were asked their phone numbers by the operator on duty. At a later date these numbers were called back and asked a series of questions regarding their use of Dial Access.

Here is what happens at the University of Wisconsin Telecommunication Center when you call Garden Dial Access. The operator puts a cassette with the taped message on the line. Watching are (left to right) James Schroeder, Dane County Extension Horticulturist; Lorne Parker, Director Instructional Communication; and Robert Devenish, Telecommunications Manager.

Photo provided by Wisconsin State Journal

The telephone survey showed:

- 95% of the callers listened to the entire message.
- 94% of the callers were satisfied with the tape information service.
- Close to 70% of callers said the tape message gave them the information they wanted.
- 92% of callers said the tape message was easy to understand.
- 84% of callers said they shared the information with 1 or more people.
- 60% of callers were in the 20-40 years of age group.
- 64% of callers had never attended a meeting sponsored by University Extension.
- 47% of callers were not aware of the services offered by the Dane County Extension Office.
- 60% of callers had never called the Dane County Extension Horticulturist.

After two successful years of Home and Garden Dial Access in Dane County and the encouraging results of the 1975 telephone survey, Wisconsin decision makers decided to expand the system for 1976. Four additional counties were added, Rock, LaCrosse, Fond du Lac, and Sheboygan and each provided with a toll free Dial Access number. There is little doubt but that when money becomes available, the entire state of Wisconsin will have Dial Access available to help answer gardening and related questions.

ORIGINAL LIST OF GARDEN DIAL ACCESS TAPES - 1974

TO USE DIAL ACCESS:

SELECT TAPE YOU WISH TO HEAR

CALL 263-3100

REQUEST TAPE YOU WISH TO HEAR BY NUMBER

GARDENING TAPES

FRUIT

2015 Tips for Starting Strawberries
2016 Post Harvest Strawberry Care
2017 Strawberries for the Freezer
2018 Summer Apple Varieties
2019 Apple Maggot - Railroad Worm
2020 Storing Apples
2021 Planting A Fruit Tree
2022 Fertilizing Fruit Trees
2023 When to Prune Fruit Trees
2024 Growing Grapes in Wisconsin
2025 Herbicide Injury to Grapes
2026 Pruning Young Dwarf Fruit Trees
2027 Everbearing Raspberry Varieties
2028 Elderberry
2029 Osage Orange
2030 Collecting Walnuts
2031 Controlling Meadowmice

LAWNS

2032 Starting a New Lawn
2033 Caring for Newly Sodded Lawns
2034 Summer Lawn Care
2035 Watering Lawns
2036 Fertilizing Lawns
2037 Raking the Lawn
2038 Late Summer Lawn Care
2039 Seeding Lawns in August
2040 Mow Your Lawn in the Fall
2041 Care of Stored Lawn Grass Seed
2042 Spring Broadleaf Weed Control in Lawns
2043 Moss in Lawns
2044 Controlling Crabgrass in Lawns
2045 Mushrooms in Lawns
2046 Skating Rinks Can Kill Lawn Grass
2047 Salt Can Kill Lawn Grasses

FLOWERS

2048 Buying Roses
2049 Uncovering Roses
2050 Feeding Roses
2051 Mulching Roses
2052 Cutting Roses
2053 Rose Insects
2054 When to Start Annual Flowers Indoors
2055 Planting Out Annuals in the Spring
2056 Spacing Annual Flowers
2057 Thinning Annual Flowers
2058 Sowing Flower Seeds Outdoors
2059 Covering Perennials for Winter
2060 Start Tuberous Rooted Begonias
2061 Buying Geraniums
2062 Dividing Mums
2063 Pinching Off Chrysanthemums
2064 Digging Gladiolus Corms
2065 Gladiolus Care for August
2066 Dividing Iris
2067 The Iris Borer
2068 Summer Care of Dahlias
2069 Disbudding Dahlia Blossoms
2070 Storing Dahlia Roots
2071 Planting Tulips in the Fall
2072 Marigolds for Biological Pest Control
2073 Mid-Summer Watering of the Flower Bed

VEGETABLE GARDEN

2074 When to Plant Vegetables
2075 Mid-Summer Plantings for the Garden
2076 Saving Garden Vegetable Seeds
2077 Harvesting Vegetables for Home Freezing
2078 Selecting Small Fruited Tomato Varieties
2079 Growing Tomatoes in Limited Space
2080 Should Tomatoes be Staked
2081 Garden Tomato Diseases
2082 Tips for Harvesting Tomatoes
2083 Removing Asparagus Tops
2084 Asparagus and Rhubarb for Home Freezing
2085 Growing Peanut Plants
2086 Sweetcorn in the Home Garden
2087 Bush Pumpkin and Squash
2088 Growing Pole Beans
2089 Can Vine Crops Cross
2090 Controlling Garden Weeds

ORNAMENTALS AND LANDSCAPING

2091 Selecting Flowering Crabs
2092 Keeping the Flowering Crab Beautiful
2093 Landscape Plants for Shady Areas
2094 Landscape Plants for Wet Soils
2095 Fertilizing Landscape Plants
2096 Hedges
2097 Ground Covers in the Landscape
2098 Watering Shrubs
2099 Selecting Evergreens
2100 Pruning Evergreens
2101 Planting Evergreens in September
2102 Winterizing Newly Planted Trees and Shrubs
2103 Selecting Shade Trees
2104 Planting a Tree
2105 Summer Care of Newly Planted Trees
2106 Fall Planting Trees and Shrubs
2107 Pruning Spring Flowering Shrubs
2108 Galls on Ornamentals
2109 Cottony Maple Scale on Shade Trees
2110 Spruce Spider Mites
2111 Pine Needle Scale
2112 Spruce Galls
2113 Controlling Birch Leaf Minor
2114 Identifying Christmas Trees
2115 Selecting Christmas Trees

HOUSE PLANTS

2116 House Plant Soil Mixes
2117 Clay vs. Plastic Flower Pots
2118 Artificial Lights for House Plants
2119 When to Repot House Plants
2120 Keep Your African Violets Blooming
2121 African Violet Diseases
2122 Amaryllis Care
2123 Care of Azaleas
2124 Winter Care of Geraniums
2125 Care of Coleus over Winter
2126 Geranium and Coleus Cuttings
2127 Watering Foliage Plants
2128 Poinsettia Care
2129 Poinsettias as a Cut Flower
2130 Care of Flowering Potted Plants
2131 Care of Cut Flowers
2132 Forcing Spring Flowering Bulbs
2133 Yellow Leaves on Foliage Plants
2134 House Plant Pest Control - Using a Pest Strip
2135 Mealy Bugs on House Plants
2136 Spider Mites on House Plants
2137 Check House Plants for Bugs

MISCELLANEOUS

2138 What is Horticulture
2139 Lady Bugs are Beneficial
2140 Soil Test Your Lawn and Garden
2141 Learn to Recognize Poison Ivy

ECONOMIC INTERCITY SERVICE FOR EDUCATIONAL NETWORKS

Richard P. Vogt
State Telecommunications Manager
Wisconsin Department of Administration

The Wisconsin Educational Telephone Network (ETN) has become a highly effective tool for bringing informational and instructional programming into communities throughout the state, many of which do not have any other convenient access to a higher educational institution. As you are already aware, ETN functions like a giant, sophisticated telephone "party-line," tied together by over a thousand miles of dedicated telephone circuits.

From a hardware standpoint, this mileage is by far the most expensive part of the service that ETN provides. If these circuits were ordered directly from the telephone common carriers in Wisconsin, their cost would exceed $45,000 per year. Systems like ETN thus depend heavily on the ready availability of low-cost, geographically comprehensive mileage facilities.

All telecommunications common carriers offer a service known as TELPAK. A telpak is simply an arrangement whereby a customer can order a group of intercity circuits between two specific points, and pay a flat "bulk-rate" price per airline mile. Telpaks may be purchased in various size increments. AT&T, for example, offers interstate telpaks of either 60 or 240 voice-grade circuit capacities. In Wisconsin, the capacities available are 12, 24, 60 and 240.

The price for a given telpak is the same, regardless of how much of that telpak one is actually using. Suppose, for example, that the State of Michigan has a requirement for 42 tie lines between Detroit and Ann Arbor. In order to accomodate these tie lines, they would order a 60 circuit capacity telpak. The charge would be equal to the rate per mile x the number of airline miles between the two cities, even though, in this case, only 42 of the 60 available circuits were in use. Michigan could, however, add circuits between the same two points at any time up to the capacity of the telpak, for no additional mileage charge.

The Federal General Services Administration operates an immense network of telpaks covering the entire 48 contiguous states. The primary reason for, and use of, these facilities is to serve federal intercity circuit requirements. However, as in our example above, there is often additional or "extra" capacity in the various telpaks. G.S.A. makes use of these by allowing non-federal governmental agencies to lease circuits from them on an individual basis. The rates for this service are extremely low: 54¢ per airline mile for voice-grade circuits such as those used by ETN, and 27¢ per airline mile for teletypewriter grade circuits.

Generally, G.S.A. requires that all circuits used by agencies in each state be coordinated through one single focal point. Thus, my office, the State Telecommunications Unit, is responsible for circuits used by counties, cities and other municipal and regional government agencies, as well as for the state (and University).

The use of these G.S.A. telpak facilities can, obviously, save tremendous amounts of money. However, there are some significant drawbacks to extensive reliance on federal telpak.

1. Distribution of facilities: Since G.S.A. telpaks are engineered to serve the needs of the federal government, they tend to serve, basically, major cities, military bases, federal institutions, and the like. In some states there are relatively few of these points, and they are often located in places where states and universities have little or no need for facilities. In Wisconsin there are about 30 G.S.A. telpak points--a comparatively plentiful sprinkling. But the northern half of the state includes very few of these points; for a system like ETN it is particularly essential that these remote areas be accessible.

2. Availability of facilities: At best, the availability of any particular circuit at any particular time from G.S.A. is unpredictable. A written request to G.S.A. for an individual circuit is made at the time the circuit is ordered. Not until after the order is completed, however, does G.S.A. advise as to whether or not the circuit has or has not been included in their telpak. If it has not, the user is liable for payment to the common carrier at regular, individual circuit, interexchange mileage rates. The difference is significant; in Wisconsin the rate per mile for such circuits is $3.13, as compared with 54¢ from G.S.A.

   Since mileage is often the most expensive part of the cost of a circuit, the availability of telpak is often the determining factor in whether to order the circuit, and it is precisely this that cannot be determined in advance.

   Furthermore, if at any time the facilities being used for an existing non-federal circuit are required for a new federal circuit, the existing circuit is "bumped" for an indefinite period of time until extra facilities become available again. This adds yet another random factor which makes budgetary planning inexact.

Wisconsin has avoided the use of G.S.A. telpak to a great extent by applying a policy of sharing telecommunications services and equipment. By increments, we have developed this sharing to the point that we now operate our own telpak network in Wisconsin.

The first area in which sharing has been implemented is that of local telephone service. In most of the major cities in Wisconsin, common telephone systems are used by all governmental agencies, including counties, cities, vocational schools, and state and university offices. In many cases we have been able to obtain sophisticated systems such as Centrex which would not be available on an individual basis to small departments and campuses. Shared systems provide better public service, eliminate the need for multiple switchboard locations and operator positions, and put all calls within government on an internal basis, also saving the cost of local message units where applicable.

At the same time, these systems have allowed the consolidation of long distance calling requirements from all over the state into a single integrated network known as the Dial Access Intercity Network (DAIN). DAIN is a direct dial, fully automated system leased by the state from the common carriers. It provides an economical alternative to Long Distance, for both voice and data transmissions, to all dialable locations within the 48 contiguous states.

- It takes full advantage of the community of interests existing among users in each major city, and among users all over the state.
- It is accessed by a single uniform access code.
- It is infinitely expandable, and can be reconfigured from month to month as calling patterns vary, without any change in user instructions.
- It makes full use of all facilities, achieving economies of scale mot possible in a smaller system.
- Individual calls are automatically routed in the least expensive manner.
- It provides complete cost allocation to each individual user, through a computerized billing system.
- It is economical, while providing an excellent grade of service.

The system today includes users from 88 cities in the state. All calls are switched through Madison, and are completed over more than 500 outgoing lines. Usage of the system averages 2,500,000 minutes per month, at an average cost per minue of less than 8¢.

Most significant of all, from the point of view of systems like ETN, is that the formation of the DAIN created a large requirement for intercity mileage facilities. This in turn has made it possible for the state to establish its own telpak network.

The Wisconsin Telpak System has grown incrementally since its inception three years ago. Figure 1 shows the system configuration as it is today, with 52 segments and well over 100,000 miles of total circuit capacity.

The DAIN provides the backbone of the system, with nearly 25,000 airline miles (or about 30,000 circuit miles) in the Telpak System. Lines to Madison for access to DAIN from the sixteen shared telephone systems around the state utilize another 16,600 airline miles. There is also another 10,000 airline miles in other access lines to DAIN, from individual state agencies, cities, counties, school districts, and regional agencies. These agencies lie outside the major cities and are thus unable to participate in any of the shared telephone systems.

Altogether, then, DAIN circuits use about two-thirds of the total capacity of the Telpak System. The remainder is available for other kinds of use, such as point-to-point lines, data transmission lines, and teletypewriter and facsimile lines.

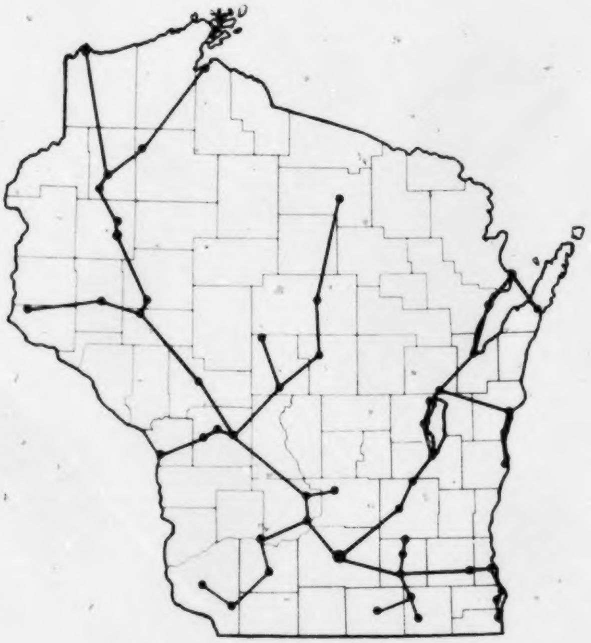

FIGURE 1

WISCONSIN TELPAK SYSTEM

We have been able, by constantly reviewing requirements and changing configurations, to achieve and maintain an efficient and economical balance in the system. Circuits are billed to users at the same rates as General Services Administration, 54¢ per airline mile.

The 52 access points reach every community of over 10,000 population in the state. Nearly any other city or town is also accessible by routing the circuit to the closest point served by telpak, and paying the higher common carrier rates only for short distances. In addition, we do use G.S.A. facilities as a supplement to our network when they are closer to the desired destination, or when particular parts of the State Telpak System are filled to capacity.

Many specialized networks have been developed which take advantage of this capacity. Our department of Health & Social Services has established an administrative message switching capability, using teletypewriter terminals, which ties together all 72 county welfare departments, and all the state health and correctional institutions. The Department of Justice also operates a teletypewriter switching system for crime information and law enforcement, which is used by the state patrol and criminal investigation bureau, by city police departments, and by county sheriffs' offices.

State Telpak users on the university side include several campuses which have created regional computer time-sharing programs which are subscribed to by local high schools and smaller private colleges. These make it possible, for example, for many small schools to offer instruction in programming and interactive processing of information.

Finally, of course, there is the Educational Telephone Network itself--one of the largest non-DAIN users of the State Telpak System. The annual cost to ETN for all telpak mileage facilities is less than $8,000, compared to the $45,000 it would cost if regular mileage rates were applied. And circuit availability is assured, along with the capability of expanding the network to all interested users.

In summary, it can be concluded that the ability of networks like ETN to provide economical telecommunications services depends directly on the efficiencies obtained by the state by combining all intercity requirements into an integrated and comprehensive whole.

ASSESSMENT CONCEPTS FOR THE EDUCATIONAL TELEPHONE NETWORK

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Assessment for the purpose of program development in Educational Telephone Communications is this report's major theme. The effort should be thought of as the study of a complex phenomena involving the fields of education and communication, for use of the educational telephone network not only involves the presentation of educational materials but also its transmission via a technological system. The unifying concept is that of program development and the assessment procedures involve both a program effectiveness checklist and a cost/benefit approach.

Program development means different things to different people but is used here to identify that activity concerned with tailoring educational programs for transmission through the Educational Telephone Network, a communications network which is characterized by multiple listening stations throughout the state of Wisconsin and the manipulation of its technical equipment. Assessment is irrevocably related to program planning and, in this case, to a particular unique technology.

Several studies have focused on identifying, describing and legitimatizing program planning. Although there is lack of agreement some aspects seem to appear in common. Program planning seems to involve planning groups making professional decisions based on concerns and opportunities. It seems perfectly appropriate, through joint effort between program area specialists and communication specialists, to reach agreement concerning a number of variables common to the concerns, interests, and objectives of both disciplines.

Extended program development for use on any mass media technology presents unusual problems in user identification. Such is the case with the Educational Telephone Network. Study of the personal characteristics of adult users serves to increase general understanding of the audience and permits testing the relationship between an anticipated audience and an actual one.

The following demographic characteristics of a given group of users could be identified after each program as a routine matter: Educational background, professional experience, areas of responsibilities and motivation for attending the sessions. Together those characteristics would provide a profile of the adult participant in a given program.

A second major research variable would be the educational program, and a third the communication of that program. It seems that expectations of an educational program and how it is to be communicated could be defined and its organization, presentation, and impact systematically measured. The expectations of an Educational Telephone Network program might be: (1) the program would be expected to create an atmosphere conducive to learning by careful consideration to the arrangement of the room, seating, lighting, and availability of auxiliary equipment. (2) The program would be coordinated by a convener at each listening station throughout the state. (3) The program content would be organized and presented to maximize participant understanding and application of course materials. (4) The program would be organized and presented as a well-defined course unit. These expectations might be translated into the following specific and measurable research variables:

1. The environment--arrangement of the physical facilities, seating, lighting, etc.
2. The technical components--functioning of the mechanical components of the program (telephone equipment).
3. Instructional materials--the use of auxiliary materials and equipment (slides, for example).
4. Convener's behavior--performance of the persons responsible for the individual listening stations.
5. Lecturer's behavior--the delivery of the course material.
6. The program process--involvement of the participants in the presentation and discussion of the program content.
7. Program influence--the impact of the educational program upon the participants.

Together these variables represent the components of educational communications and provide the bases for an assessment checklist, the instruments used to gather data from users after Educational Telephone Network programs have been presented.

Typically Program Assessment Checklists consist of approximately twenty-five items to which users respond at the conclusion of a program. For example, in assessing the impact of a program, participants might be asked to respond to the statement: "People tended to leave before the presentation was completed." They could record their responses by selection of one of four categories: (1) not descriptive, (2) minimally descriptive, (3) somewhat descriptive, and (4) most descriptive. The intent would be to create a cybernetic system which uses data thus generated as an information feedback device for program planners whose task it would be to compare it with program expectations, the results of which could determine further operation of the system. For the Checklist to be of value in a cybernetic system, it must be interpreted on three levels (see Figure I).

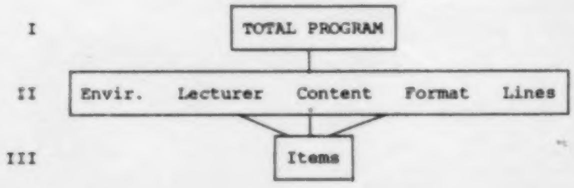

FIGURE I

The planning group would want to have an assessment of the overall program (level I). They would need an indication of the performance of each cluster (level II) and perhaps even more important they would need some insight into why performance occurred as it seemed to do (level III). While level I gives a summative assessment of the effort it is level II and III that enable a program development group to draw inference affecting on-going program development.

The overall assessment might be tabulated to show the average of all mean scores from usable items in relationship to a four point scale but in most instances users would simply be asked to assess programs as a unit and record their responses by selecting a position on a 9-point scale with a mid-point of 4.5. If this is the case the following tabulation might be presented to a planning group.

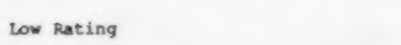

FIGURE II

The cluster assessment provides an opportunity to compare components of the program and would be tabulated in graph form (Figure III).

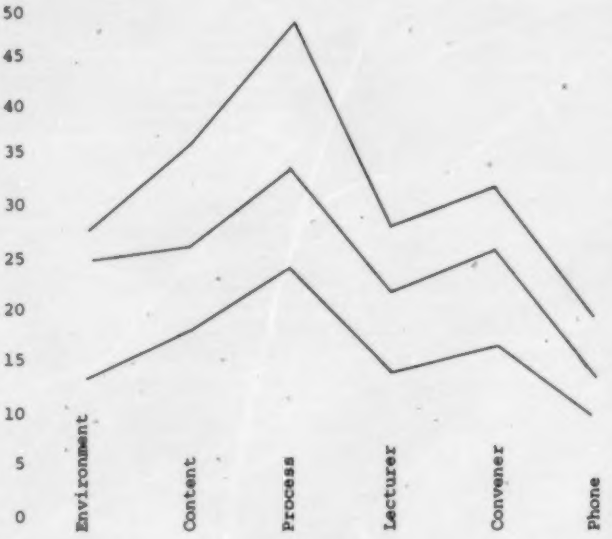

FIGURE III

Three scores can be recorded for each cluster: In the example above (Figure III) the top line indicates possible total ratings, the middle line indicates participants' ratings, and the bottom line indicates midpoint ratings. The possible total rating (top line, Figure III) is a result of multiplying the number of categories by the number of items in a cluster, giving a total possible response. For example: If the scale has 4 categories, and there are 7 items in the cluster (4 x 7 = 28). Or in other words, the total possible number of responses to 7 items is 28. This is shown as the environment cluster in Figure III. The users' ratings (middle line, Figure III) results from adding together mean scores of each of the 7 items to give an actual response level of 24.7 for all items in the cluster. The average rating (bottom line, Figure III) is ½ of the total possible responses in the example above. In the example, it would be 14; ½ of 28. This type tabulation gives visual impact to reported responses in relationship to two reference points: (1) What is possible and (2) a mid-point. In a gross way it gives an impression of the effectiveness of a component. A less gross interpretation is possible by observing the statistics. However, the question still persists. Why do the clusters look like they do?

In order to make the cluster assessments more meaningful a standard deviation of, say, .5 might be established to the left and right of the scale mean. Then the item describing a condition could be assessed in relationship to that standard and one could quickly see how responses to each condition affected the accrued responses to a given cluster of items used to describe that component of the program.

If the mean score of an item fell below the .5 deviation the interpretation would describe the condition expressed through that item as weak. Conversely, if it fell above .5 it would indicate a strength of the program. All other items (describing conditions) would be thought of as a proper norm.

An effort would be made to correct the weak aspects for the next program, capitalize on the strengths and continue the normal conditions. Tabulation and interpretation of data in such a way enables fast feedback that can be assimilated quickly by a planning group. However, when the user is given an opportunity to write out impressions of a program valuable insight may be gained as exhibited by the following examples:

1. Too much repetition
2. Subject matter not clearly outlined
3. Need better introductions for speakers
4. There should be an outline guide before the program
5. Visual aids would have helped maintain interest
6. Reception early in the program was poor
7. Have group discussion at individual centers to share viewpoint
8. Be more specific
9. The lecturer should speak slower
10. It has been so long since I taught that it was a real pleasure to have a chance to get acquainted with new viewpoints.

The cybernetic system described is a one shot, post-mortem, no control system. There is no possibility of drawing valid conclusions for other programs, nor is there any desire or need to do so. The value of such a system relies heavily on professional judgment (program planners) and interpretation related to a particular situation. It works well for components of a program other than subject content.

There is no statistical base for deciding if the program under study had any affect or not on knowledge level. It would be easy to say that the users may well have been at this level of knowledge prior to the course. If a comparison measure is desirable, it could be accomplished by either a pre-post test depending on random assignment, or through the use of a control-experimental design wherein a control group is administered the test but without exposure to the content material. On the other hand, if program planners take into account the results of a situational analysis or needs assessment of potential users, they may become aware of a desired or minimal, or even optional level of knowledge. And the assessment certainly will show how close the users have come to this desired level of knowledge.

The strength of this system from a subject matter viewpoint lies in indicating the present level of knowledge of those who have completed the program. One cannot say how far they have come, but based on the judgment of the planning group, one can say how far they still have to go, or how much more information the instructor should have presented or should aim to present next time. Also, qualitative data might be desirable. What are the specific errors being made in content by the participants? In what direction is that error? A surprisingly small sample should detect the direction and degree of content error if one wishes to build that dimension into the system.

Recognizing the program evaluation checklist system has limitations, one must keep the purpose for using it clearly in mind. It is to assess two major variables: (1) educational planning and (2) communications as they are effected by a unique technology--namely, the Educational Telephone Network. The assessment system is designed to get immediate feedback on anticipated results and is of value in direct relationship to the skill of program planners' interpretation. It is a system which must relate to post program description of participants while at the same time attempting to build more understanding of anticipated audiences.

Feedback is accomplished by creating a program checklist consisting of items which describe certain components of a program. This list is administered immediately after a program, returned from the listening location to the main educational telephone network office and tabulated through a pre-set computer program. The computer program read-out gives data needed for an overall assessment, a cluster assessment, and an item assessment. This information is tabulated and returned to the planning group whose responsibility it is to prepare the next program session. If future planning is improved by use of such feedback, the print-out data will have served its purpose.

Of the more common sources of error in this type system such as sample, response, processing, measuring, instrument, and interpretation, the system is most vulnerable at the last two levels; measuring instrument and interpretation levels.

The system's reliability is dependent to a large extent upon the pragmatic skill of the program planners in interpreting the cluster data and in their ability to predict changes that would lead to an improved learning situation. Reliability of the measuring instrument may be further improved by assessing trial runs, and being more alert to reasons for variation between item responses from one program to another for equivalence and stability consistency in performance. Likewise, the instrument's empirical validity will lead to better diagnosis of performance and thus contribute to a continual improvement of programs. Even if the program checklist procedure worked perfectly additional information is needed to get the maximum value from the Educational Telephone Network programming and help assure its continual growth. One gap of information is related to benefits derived by users and costs involved.

There is some tendency in the literature to compare costs with effectiveness of programs in place of costs related to benefits derived from programs. The intent in working with the Educational Telephone Network, however, is to make a clear distinction between effectiveness and benefit, and deliberately use cost benefit terminology. The discussion up to this point has been more related to effectiveness of programs as distinguished from obvious and observable benefits to the participants and sponsors of the network.

It has been proposed for at least a century that the benefits of higher education might be divided into three broad categories: (1) those associated with intrinsic value consumed concurrently with attendance such as being part of a culture, (2) intrinsic investments made during attendance such as acquiring the good life, and (3) current investments in the attainment of competencies that will provide future returns in the form of productive enterprise. Of the three benefits delineated, the last--current investments in the attainment of competencies that will provide future returns in the form of productive enterprise plus the dictionary definition: "to be useful or profitable to mankind"--provides a working definition of benefit to begin study of the Educational Telephone Network from a cost/benefit viewpoint.

Cost is defined as the dollar figure necessary to pay the staff involved, the telephone line fees, capital and supplies expenditures. It is expressed through a ratio of actual costs related to the number of users per contact hour. A contact hour is defined as that portion of time (60 min.) during which an instructor and one or more users are face to face for some educational purpose via the Educational Telephone Network.

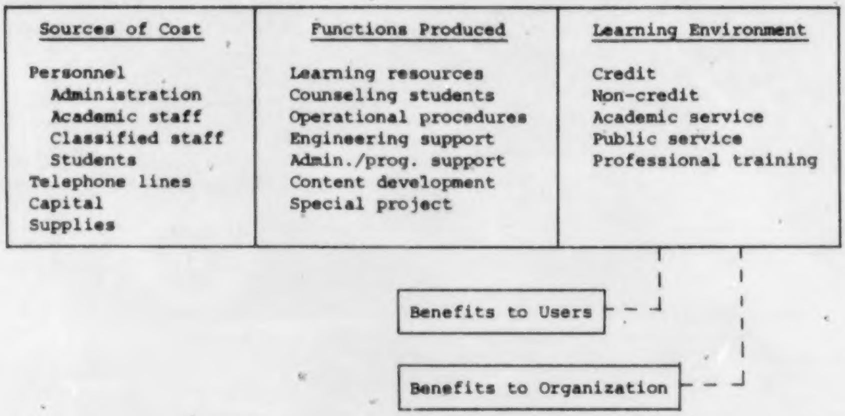

FIGURE IV

Table IV diagrams the interrelated categories of the scheme which produce the cost and illustrates the relationship of benefits to that cost. Reading from left to right, the first box shows sources of cost to produce functions which create the learning environment at locations on the network. Benefits both to users and the organization are related to this learning environment.

Producing functions are defined as the activities that go into creating the learning environment. Activities such as learning resources, operation procedures, counseling students, program production, technical operations, plant operations and content development. These activities are performed by people using resources and facilities described as sources of cost. And the learning environment is defined as the fundamental operating entity of the environment with which the user comes into direct contact with the system--the dynamics of the user and the system.

Although other educational technology may fit into such a scheme, the intent is to delineate the components of the Educational Telephone Network as a unique technology so it can be studied from a cost/benefit viewpoint. Like other types of communication vehicles, the Educational Telephone Network has its unique qualities. There is less separation of consumed and invested outcomes of instruction in Educational Telephone Network programming. In other words, there exists a closer relationship to immediate need than in traditional higher education. There is an autonomous nature to a program at each location even if it originates from a common source so that locations can be compared. Programs are appropriate to the autonomous nature and free choice of the user. And last but not least, it should be observed that a lack of self-discipline on the part of a user may negate the total program value. It is questionable whether the Educational Telephone Network can be compared in cost/benefit with other vehicles such as educational television by this scheme because of the observed uniqueness of the Educational Telephone Network.

Thus the problem has two aspects. First, to find a ratio between the cost of producing functions necessary to provide learning environments on the Educational Telephone Network and the number of users (quantitative) and second, a measure of the benefits derived from the learning environments (qualitative) by users and sponsors of the system.

A single worksheet may be used to compile necessary data for cost ratio dimensions. The upper portion including program title, starting date, etc. will provide the number of contact hours for the second part of the ratio. The lower part of the worksheet is more difficult to complete because it requires a delineation of staff time which can be converted to a dollar figure as well as a formula for determining supplies and capital as a budget matter. The intent is to place a dollar value on each procedure necessary to produce programs under study, a total of which will provide the first part of a ratio. The desire, of course, is to go beyond this ratio of contact hour/cost and attempt to discover some of the benefits derived from such effort other than those related by numbers.

There are at least two recognizable units whose members may be recipients of benefits: (1) the user group and (2) the organization supporting the Educational Telephone Network system. The users will benefit in three ways: (1) through the value of knowledge gained, (2) through moral and aesthetic qualities of the program, and (3) through increased professional competence. Thus, an item on a benefit response questionnaire might read: "This program has helped me keep current existing knowledge." Another example might be: "This program has helped me solve one or more problems I have been having." Or, "Considering where you live, do you feel this (ETN) is a helpful way for you to obtain current information from the university?"

The organization supporting the Educational Telephone system stands to benefit from better understanding of user cost ratio and distribution of users by location. Such information could well influence program selection and distribution policy of the organization. Justification of current expenses and support for expansion of facilities, public relations and direction of promotion activities could follow. Most important, a base would be established for relationship judgments between effort and value and uniqueness of learning environments. Again, the organization supporting the network could benefit in direct proportion to the skill with which cost/benefit data are used by staff.

The statewide diversity of listening locations provides an opportunity for comparison, one of the desirable characteristics of cost/benefit study. Any number of combinations of locations may be designated as learning environments for comparisons. The locations to be compared might be geographically distributed or by different types of learning locations such as courthouses, hospitals, or campuses.

A specific time period must be designated, and the programs comprising the learning environment during that time classified. A reasonable classification would include: organized credit classes, organized non-credit experiences, service to academic community, public service and professional training. A cluster of benefit type items might be included with the checklist described earlier. Also, during the designated period of time the Educational Telephone Network staff would keep a daily log of time devoted to various production functions. These data would be converted to dollar figures at the end of the time period and combined with the non-human cost factors available from the budget by applying appropriate formula. Tabulation of attendance by contact hour would complete data needed for a ratio showing cost per contact hour. For example: If the total dollar cost for a given program was $5,000 and it reached 121 users through 15 one-hour sessions, the number of contact hours would be 1,815 (121 x 15 = 1,815). The quantities to be compared then would be cost of $5,000 and contact hours of 1,815. The terms of the ratio would be the first by the second resulting in a quotient of $2.75 (5000/1815). The cost for the program would be $2.75 per contact hour. Compiling the results of responses to the benefit scale, 121 in this case, would complete the data collection and hopefully provide insight of value to program planners and to the maintenance of the system.

As is true with the program checklist, professional judgment is an important part of getting the most from cost/benefit information, comparing cost per contact hour is not compared with benefit data by statistical method but rather by subjective professional judgment. For example: When 465 participants in a beekeeper educational telephone network program from around the state answered yes to the question: "Considering where you live, do you feel this (ETN) is a helpful way for you to obtain current information from the university?", it gives administrators a base line to assess costs regarding current expenses and projected expenses. The same information can be used as a public relations tool and for setting program priorities, relating value to effort and as an indicator of accountability. But cost/benefit information need not be just an administrative tool! If 90% of the 465 participants from the same beekeeper program answered yes to the following statement: "This program has helped me solve one or more problems I have been having.", then the program would seem to have met a benefit criteria thought important for the user; namely, that the force of knowledge was beneficial.

The proposition that cost benefit data are of as much value to program development processes for the Educational Telephone Network as for administrators' decision making seems pretty well established, and their complimenting relationship to effectiveness data seems apparent.

If program development for the Educational Telephone Network is to be served, assessment by the two approaches described seems defensible. In one case information is obtained which helps to describe the effectiveness of the system while the other attempts to describe how participants in educational telephone network programs benefit from their experience related to cost per contact hour. Either approach is of little use unless program planners are willing to interpret information and make appropriate changes from program to program.

As the Educational Telephone Network is a unique technology for education so are its assessment procedures unique! They most closely fit the idea of field testing a theory which produces revisions, or a formative evaluation approach as described in the literature. On the other hand, they may amount to a summative evaluation if the early forms of a program sequence are properly described. One characteristic of educational telephone network programming is that seldom is a given program repeated exactly the same way. It is not a matter of evaluating a packaged program for repeated use but rather the drawing of inference to guide production of a similar educational experience. The overall strategy suggests a cybernetic, interlocking system that would help the Educational Telephone Network identify and monitor in a continuous way, the potential sources of strengths and weaknesses of various components making up program development on the network.

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THE TELEPHONE AND EDUCATION; A CASE STUDY IN LIBRARY SCIENCE

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Samuel Baskin has indicated that "used in an intelligent and sensitive balance, the new media and technology can offer a great deal towards an integrated instructional process in higher education."[1] Such a statement immediately brings to mind television, computers, sattelites, and such spin-offs as cable TV and computer assisted instruction. Even radio. But the telephone? Perhaps the telephone is not a new media, but certainly modern technology has refined the instrument and its attachments to the point where it is being used in the learning process.

The literature is replete with descriptions of learning situations using the telephone in instruction but there has been very little written on the historical development of this "new media and technology". Telephone service for the public came into being in this country around 1877. The first reported instructional application of the telephone occurred in Iowa in 1937 when it was utilized to meet the needs of homebound and hospitalized students. On the post secondary level the first reported application was in November 1947 at the College of Dentistry of the University of Illinois, Chicago Medical Campus. In the 1950's, as the telephone began to get attention from American educators, limited scale applications began to appear at all levels of educational programs, elementary to graduate. However, many of these applications turned out to be one shot projects that were not implemented on a continuous basis.[2]

It is general consensus that credit for the first organized and implemented applications of telelecture was that on the campus of Stephens College, Columbia, Missouri.[3,4] Although amplified telephone lectures began at Stephens in 1958, a federal grant in 1959-60 provided the impetus for the organization of the above cited series.[5] The Fund for the Advancement of Education provided monies to further experiment during 1963-64. The results of this project have been reported by Burkhart.[6]

Stephens' activity served as a prelude for the 1960's when a number of states including New York, California, and West Virginia, began to develop statewide telephone instructional networks. These were frequently part of a state university extension service. According to Cook, a May 3, 1962, demonstration at LaCrosse State College jointly sponsored by that college, the University of Wisconsin Extension Division, and the LaCrosse Telephone Company was the beginning of such activity in Wisconsin.[7]

These developing systems of the 1960's included elementary, secondary, and post secondary education. During the latter part of this decade and gaining momentum into the 1970's, telelecture began to be used more and more in adult education. This was probably a natural result of the interest of university extension services but also reflected the renewed thrust in this area by higher education in general. During this period, telelecture also began to be used in various ways by a number of individual disciplines in higher education. As WATTS telephone lines and other ancillary developments have blossomed in the first part of the 1970's the use of telelecture has been refined and polished.

It appears at this time in the history of telelecture that the possibilities are only limited by imagination. Studies conducted in the use of the telephone in education seem to show that it is effective and that students react favorably to the telephone as a teaching medium.[8] Both Peterson and Kreitlow have pointed out in detail the advantages of telelecture as an educational tool.[9,10] However, one cannot help but feel that its many advantages are not universally recognized. The report of the Commission to Improve Learning, better known as the Tickton Report, contains no reference to telelecture in its index. A reference to "Teleinstruction" refers to the use of television as an educational aid. There are copious references to Instructional radio, Instructional technology, and Instructional television, but nary a dial tone for the telephone as an instructional device.[11]

The Carnegie Commission report on instructional technology in higher education likewise gets no answer on the telephone. A table giving the "characteristics of instructional media" runs the gamut from "class lecture" to "automated storage and retrieval," but even the "other" category fails to dial the telephone number.[12] Although one tends to be pessimistic that such milestone reports in the field of instructional technology fail to recognize the potentialities of the telephone as an educational aid, one can hope that since these reports were basically written in the late sixties, similar studies today would take into account the increased activity with telelectures in the 1970's, recognizing telelecture as one of the modern media.

The use of the telephone in education can be grouped into five general classes:

(1) As a component with other hardware in such delivery systems as the telewriter.[13]

(2) In a one-to-one relationship conveying educational information to the ill and handicapped.

(3) In a system linking a number of service points together for the offering of a complete course emenating from one central point to the various service points.

(4) A system linking a number of service points but used only occasionally to each point, that is not offering an entire course.

(5) As a means of bringing an outside personality, expert, or event to a formal classroom

situation to achieve a particular educational objective.

Although reports of all these types may be found in the literature, many of those in the last category involve a specific discipline. The specific discipline of my interest is library science and since telelecture is apparently not used in the teaching of library science, perhaps it would be beneficial to detail the results of my experience in developing a telelecture presentation for this discipline.

I received the opportunity to implement Baskin's observation referred to at the beginning of this paper through teaching a course in the Graduate School of Library and Information Science at the University of Missouri-Columbia. One of my objectives as the instructor in Library Science 443, Academic Library, was to expose the students to another academic library administrator, preferably one also involved with many facets of the library world. It would be difficult and expensive to bring such an administrator to the classroom on the Columbia campus. Baskin's observation prompted me to consider the use of the "telelecture", one of the developments of technology that provides education with a new form of learning media. Brown has described the telelecture (amplified voice telephone) as a variation of the in-person forum-lecture teaching format, wherein the college avails itself of the instructional contributions of guests who cannot come to the campus, but who are willing to devote time to a telephone dialogue with a remote class.[14]

The literature search, although uncovering a number of exhortations concerning the use of new media in the teaching of library science as well as several discussions on the use of specific media, failed to uncover any evidence that indicated telelecture had been used in the teaching of library science. One of the earliest recognitions of the possibilities of the use of media for teaching library science was that of Stone in 1961. He stated "the shape of the future in educational media holds some important implications for the professional education of librarians." He was optimistic about various forms of media in library education stating "as we have learned the importance of newer media and their roles in education, we have begun to adopt some new methods of teaching." The new methods listed did not include telelecture.[15] Several years later Goldstein reported that attendees at a workshop agreed that for a course in Introduction to Librarianship "the telelecture will probably be used increasingly to utilize off-campus specialists.[16] It wasn't until some years later that Lieberman listed telelectures as a specific technique along with other media useful in the teaching of library science.[17]

Articles such as Allen's[18] concerning the use of slides and Penland's[19] involving programmed instruction in Library School instruction, and Totten's survey, which furnished data on the use of educational media in the teaching of library science, although covering educational television, teaching machines, programmed learning materials, recordings, opaques, slides, filmstrips, transparencies, and motion picture, did not include telelecture.[20]

One might ask why this apparent lack of interest in telelecture? Could it be that library educators are more interested in educational theory than in the practical implementation of this theory? Lowrey made a strong plea for library education to institute creative and innovative reform. But she was mainly writing about software and techniques rather than the utilization of innovative hardware.[21] Could it be that telelecture is too new for the library science educator? This doesn't seem possible since as we have demonstrated it has been utilized by other segments of the educational community since the late 1950's.

Perhaps library science educators believe telelecture is not an effective technique. Yet Rookey reported that students taught by telephone did as well as others and though they were disturbed by the fact that they could not see the instructor, they felt this disadvantage was offset by other factors.[22] Burkhart, in reporting on the early experiments at Stephens, reported that "the potentialities of this new media are great." However, he cautioned:

> Classroom interviews are not self-operating. The teacher must be thoroughly familiar with the topic or area of discussion, must know something about the background of the interviewee, and be prepared to direct the discussion along profitable lines, preventing it from becomming just another "bull session." To do this requires knowledge and skill on the part of the instructor. Associated with the larger and more difficult role played by the instructor is his personal involvement in the interview. Frequently the intellectual excitement is so great that the teacher is literally worn out at the end of the class session.[6]

Since the University of Missouri had used the telelecture in its extension classes and had the mechanical aspects of the technique mastered, it was not difficult to adopt the technique to Library Science. With the daily class period during the summer school two and one-half hours long it was possible to use the telelecture with full utilization as a learning aid in the class I was teaching.

Having the approval of the Library School administration, the first step was to find a librarian who not only met the objectives stated earlier and who would be willing to spend time not only in talking to the class as well as doing the preparation necessary but would also be a well-known personality and an acknowledged expert in order to provide these necessary ingredients to a successful learning session.[23] Happily, Albert P. Marshall, then Librarian at Eastern Michigan University and second vice-president of the American Library Association, and now Dean of Academic Services at Eastern, was gracious enough to take time from his busy schedule to participate in this experiment.

As planning commenced it became evident that Burkhart's comment about classroom interviews not being self-operating was valid.[6] Even though the technical details of the telelecture session were left to the Instructional Services Staff of the University, many tasks remained for the instructor in order to facilitate an effective learning environment. The stated objectives of the particular class session were formulated and sent to Mr. Marshall. The broad discussion areas for Mr. Marshall were defined by the members of the class. Applying principles of adult group participation and a modified version of the Delphi Technique, the class members ranked areas dealing with the academic libraries according to their interest. The top ranked four subjects were the ones sent to Mr. Marshall to serve as a basis for his presentation.

The telelecture session was planned for the middle of the semester. This, coupled with the fact that the majority of the class members had library work experience, made it easier to involve the class members in the decision process. Several class sessions before the day to decide upon the areas to be covered by Mr. Marshall, the class was told of the coming experiment and made aware in a general way of some of the current trends and problems in academic libraries. At this time, a biography of Mr. Marshall was distributed to the group. Conversely, a class roll with brief comments about each student's background, particularly as related to library activity, was sent to Mr. Marshall.

To help make his telelecture more understandable, Mr. Marshall prepared and sent transparencies and related material to be used during the telelecture session. Accompanying these materials were a set of ten slides showing Mr. Marshall in his own library work environment. This was done at the suggestion of one of the members of the Extension Department at UM-C and proved to be a sound procedure. During the telelecture, the use of these slides and the other materials overcame the handicap of students not being able to see the instructor.[22]

As further preparation and to give the session as broad a base of participation as possible, each member of the class was asked to prepare one question for Mr. Marshall's consideration during a question and answer period following the prepared presentation. All of this preparation apparently did not interfere with the other daily learning experiences of the class, and the members looked forward to the telelecture.

The appointed day and time having arrived, the class met in a room in Whitten Hall where the Division of Educational Resources and Services of the University maintained the required equipment. In addition to the telelecture apparatus itself, the room contained a screen, a slide projector, and two multi-directional microphones. As the time for the telelecture approached, the instructor again handed out copies of Mr. Marshall's biography, reviewed the format of the session, encouraged the class to ask questions, and projected an image of the speaker on the screen.

It had previously been suggested to Mr. Marshall that he use a desk unit supplied by the phone company to hold the telephone during the telelecture. However, the initial reception was very unsatisfactory and upon the suggestion of the technician from Educational Resources and Services, Mr. Marshall was asked to use his telephone in the usual manner. This proved to be somewhat uncomfortable for the guest speaker but provided excellent reception. Later discussion with the technician disclosed that apparently the desk holder for the telephone first used very rarely proves to be satisfactory.

With his picture on the screen, Mr. Marshall was introduced to the class by the instructor. From the information previously sent to Mr. Marshall, he gave his presentation as the instructor projected various transparencies as requested. After the presentation, the question and answer period began. The class was seated in alphabetical order around the table in order to assist the guest speaker in identifying the class members. At the beginning of the question period, I happened to call upon Miss A. What then developed was that each person in turn asked exactly one question before releasing the floor to the next class member. After reaching Miss Z and upon some slight prodding on my part, various class members asked additional questions of the lecturer. Since the telelecture session, I have wondered as to the degree of correlation between the seating arrangement and my instructions to prepare one question. Perhaps this contributed to the unevenness in class participation during the question and answer period but in any event points up one of the difficulties of telelecture as cited by Kreitlow.[10]

At the conclusion of this period, since some time remained, the instructor asked additional questions that he felt would be of interest to the class as well as those questions that were originally suggested by the class, but had too low a rank in the class rating to be used as the basis for emphasis during the presentation. Throughout the session the instructor would periodically change the picture of Mr. Marshall appearing on the screen.

Afterward, certain followup procedures endeavored to evaluate the telelecture as a learning experience. At the next class session, discussion was held concerning some of the observations made by Mr. Marshall. This proved to be a lively session with much interaction between the class members. The two most hotly debated subjects were those of maxi-mini reference service and the salesmanship approach of the professional staff to the students. In response to comments during the telelecture, Mr. Marshall subsequently sent various materials and other information pertaining to his library. These were distributed to the class when they arrived without a great deal of comment. At the conclusion of all activities relating to the telelecture session, each class member was asked to give his or her evaluation of the telelecture.

Was the telelecture successful? In that it achieved the stated objective of exposing the class members to another academic library administrator, it was. Although written and verbal comments of the students showing the reoccurrence of theories and philosophies expressed during the telelecture were expressed during the rest of the semester, thus leading me to believe that the session was successful as a learning experience, I have no statistical evidence available to validate my conclusion.

My evaluation of the telelecture indicated several modifications would improve the learning environment and overcome some of the difficulties that others have cited. If it is true that the telephone desk holder is not effective, the elimination of this device should be made immediately if transmission problems occur. The difficulty in not so doing is pointed out by the student who commented: "The early part of the conversation was impossible to understand. By the time the static was cleared, I could not join in the conversation." The sending of a picture or pictures of the class to the guest speaker would also improve the communication process.

Since there was no back charge to the Library School by the Division of Educational Resources and Services, the University Watts line was used for transmission, and the guest speaker generously participated in the experiment without fee, the telelecture added no costs to the Library Science instructional program. Thus Carpenter's contention that in spite of fashions and fads in educational facilities, the most economical equipment that will satisfactorily do the defined and required instructional functions should be used, was validated.[24]

The condition of the physical surroundings, while workable, certainly bore out the belief of Knirk that form should follow function.[25] The facilities in Whitten Hall were not specifically designed for media assisted instruction, and certainly made student, technician, and instructor participation in the learning process more difficult. While I suspect that the Hawthorne effect showed to some extent as in one student comment "This is the first time I have been involved in a telephone lecture of this kind. Perhaps one reason I liked it was because of the novelty of the situation. It also had a freer and more open and spontaneous atmosphere than I had anticipated," I believe this was minimal. Generally, it appeared that the better students were more positive in their reactions, as evidenced by the following: "The opportunity to ask questions and to have responses back and forth was invaluable. It was so much more enlightening than reading a dry textbook and listening to a straight lecture. It seems to me to be a tremendous way to reinforce and to supplement the knowledge gained from any course."

While most students indicated by such comments as "I hope that other professors will follow your idea with a similar program for their classes" and "We should take advantage of the facilities offered by the University of Missouri and contact similar individuals" that they favored telelecture for other courses, such comments as "...his ideas and personality came through very well on the telephone hookup after the technical problems were solved," point up the importance in selecting a guest who has a "telephone" personality.

After completing the above experiment and resuming my role as Director of Libraries at Northeast Missouri State University, I was pleased to discover that an assistant professor of economics on our campus, Pat Ellebracht, had began to use the telephone to bring outstanding figures in this field to his classes several times a semester. As the program grew we developed the pattern of recording the sessions, keeping a file of the tapes in the media portion of the library. At the request of a student, a duplicate copy of the tape is made for their personal use. The success of the series, plus the centralization of the hardware necessary for the telelecture under the direction of the library, together with the ability to develop good multiple physical facilities around the campus, has encouraged faculty in music, science, business, and history to try telelecture. If our feedback is accurate, the results seem to bear out Kruck and Tversky's contention that telelecture is one of the most effective ways to bring outstanding resource persons to the classroom.[26]

I believe that our experiences prove that with imagination, energy, help, and planning (back to Burkhart again) post secondary education can utilize telelecture in various situations. As Gagne' has stated: "The arrangement of instructional conditions is still the key to effective instruction regardless of the medium or media employed."[27]

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TELEFUN AT THE UNIVERSITE DU QUEBEC: (2) TELELOGO

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ABSTRACT

A technically straightforward but pedagogically innovative course is described. Telephone lines are used to enable teachers around Quebec province to take a computing course based on the LOGO language. Importance is attached to a communication system which enables students to send messages to the operator-facilitator and also to swap programs and ideas with classmates in other towns.

INTRODUCTION

Using telephone lines to transmit data is now a routine activity all over the world. Furthermore the concepts of computer conferencing and the electronic mailbox are no longer new. However, it is still uncommon to see these techniques combined so as to enable students spread over a vast territory to work together on the computer in a creative manner.

The Télé-université is a distant study institution covering Canada's Quebec province and one of its programmes, PERMAMA, is designed to upgrade the skills of secondary school mathematics teachers. One of the courses in this programme is designed to introduce teachers to the computer. Although the course naturally includes basic programming skills it is also intended to highlight the mathematical aspects of computing, particularly the notion of algorithm, and to prepare teachers for the arrival of computers in the schools. These objectives have to be achieved in a distant study context where students are spread over an area extending for more than a thousand miles.

FEATURES OF THE COURSE

The course combines a number of features in a novel combination. Among these features, each of which is discussed in more detail later are the following:

1) The course is based on the LOGO language specially developed for educational applications at the M.I.T. Artificial Intelligence Laboratory.

2) After spending a month learning basic programming skills students spend the remaining two months of the course developing projects of their own design.

3) The course is offered in sixteen different towns each term. This involves setting up a temporary interactive network for each three month period so as to link terminals to a DEC-10 computer in Montreal.

4) Although the course has employed teletype terminals to date a radically new graphics terminal is being phased in this year.

5) An operator-facilitator is available at a central location during the (evening) working hours.

6) An electronic mailbox enables students to communicate with the operator-facilitator and with each other in an asynchronous manner.

USE OF THE LOGO LANGUAGE

One of the first choices the course team had to make in the planning stage was the programming language to be used. The choice settled quickly on the LOGO language rather than on more traditional languages such as FORTRAN and BASIC. This choice was motivated by the following considerations:

a) LOGO is one of the few languages designed specifically for educational applications.

b) The language reflects current knowledge on human cognitive development. It is close to natural language and can easily be used by children[1].

c) Despite its apparent simplicity LOGO is a powerful computing language which can satisfy and enthrall even the most experienced programmer.

d) The language can be thought of as a sort of computing meccano enabling powerful procedures to be constructed from a group of simple sub-procedures.

THE ROLE OF PROJECTS

Since the aim of the course is not chiefly to train programmers but to provoke a reflection on the rôle of algorithms in mathematics and the various uses of the computer in the classroom, students are encouraged to work on projects of their own choice and design. The LOGO language facilitates this approach since a student can quickly learn the programming skills required for quite complex projects. Furthermore the nature of the language itself is such as to present the student with a laboratory designed to encourage creative projects.

THE NETWORK

The Télé-université has students in some 70 centres. However, since access to the DEC-10 computer is limited, only 16 ports are available for the course at any time. Thus 16 centres are chosen each term and a temporary network is set up. A teletype terminal is placed in each centre and linked by telephone lines to the central computer. Each centre enrols some eleven students and the terminal is available for six hours each evening and on weekends. Students are encouraged to work in pairs, giving them two three-hour working periods per week. Since these periods are in the evening the university and government telephone (voice) networks are used and this represents a very significant saving. At the time of writing the course network runs from Gaspé, at the mouth of the St. Lawrence, some 1045 miles to Lasarre in the north west of the province. Despite the size of the network and its temporary nature very few technical problems are encountered.

TERMINALS

Although teletype terminals have been used to date the course team sought, from the planning stage, to take advantage of the graphics and geometrical drawing capabilities which can be readily exploited with the LOGO language. An order was placed for the first batch of the new General Turtle TT2500 graphic terminal and delivery of this equipment has begun. These terminals will be phased in gradually for the present course and will be used in future courses that the Télé-université will develop.

THE OPERATOR-FACILITATOR

During evening working hours an operator-facilitator (opérateur-animateur) is present at a terminal in Montreal. Although students can make voice contact with him in the case of communications problems they are encouraged to used the electronic mailbox for all other messages.

During the early weeks of each course, the operator naturally helps students surmount rather simple problems and eliminate obvious bugs. However as the term progresses his rôle becomes more interesting. He helps them refine and develop their projects, suggests ideas, and incites them to reflect on the pedagogical applications of what they are doing. In general, he avoids giving pat solutions to student difficulties but tries instead to ask questions which will lead the student to find the answer himself. The asynchronous nature of the electronic mailbox system allows the operator to work efficiently by dealing with the most pressing problems first. During the day he can review individual student files on the computer and leave comments and suggestions which the student will receive when he next logs in.

THE ELECTRONIC MAILBOX

Although the electronic mailbox is neither a new nor a technically complex feature of computing, LOGO was one of the first languages to exploit this capability for educational purposes. The primitive "MAIL" enables a student to send a message to any user or users he designates and use of the primitive "LETTER" allows him to obtain the messages which have been addressed to him.

At the beginning of the course students use this system to discuss problems with the operator and to make exploratory contacts with unknown 'classmates' in other centres. One such use which made us somewhat nervous was the exchange of messages across the province about union tactics in a teachers' dispute. The operator uses the system to reply to individual messages and to make general announcements. As the course progresses the operator identifies students who are working on similar projects and puts them in contact with each other. Another aspect of the mailbox is a classified ad system. A student who needs a procedure for e.g. plotting graphs, can place an ad in the system, and students who have developed special procedures can advertise their availability. Students can call up this 'journal' whenever they are at the terminal and the swapping of procedures thus produced enriches the projects carried out.

CONCLUSION

Just as the University of Wisconsin has used established telephone technology to eliminate distance and make courses available statewide, the Telelogo project has harnessed telecommunications and computer technology to prepare teachers over a vast area for the next educational revolution. Side effects of the asynchronous feature of computer mediated interaction are that the instructor can give personal attention to more students and that communication between students is encouraged.

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